

# Roundabout

Magazine of the IPENZ Transportation Group

Issue 149 September 2016

## What can we learn about transport from Vietnam?



*Also in this edition:*

- Is our ITS vulnerable to hackers?
- Sydney relays road 24 times
- Cycle superhighway to hell
- Northwest Pacific learnings
- E-bike survey
- And much more!



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*"They rip up the road on Saturday and rebuild it on Sunday so motorists can use it on Monday. They will repeat this process for almost half a year."*  
p46

*"In those days the internet was new so not everyone had it."*  
p8

*"Driverless cars are typically hit from behind by inattentive or aggressive humans unaccustomed to self-driving motorists being such sticklers for the road rules."*  
p25

*"There is some bad news about the German roundabout guidelines, however – it's all written in German!"*  
p26

*"One word. "Poop." It wasn't so much the word, but its position that caused Lori Nichols to turn her car around."*  
p38



Roundabout is the magazine of the IPENZ Transportation Group, published quarterly. It features topical articles and other relevant tidbits from the traffic engineering and transport planning world, as well as details on the latest happenings in the NZ transportation scene.

All contributions, including articles, letters to the editor, amusing traffic related images and anecdotes are welcome. Opinions expressed in Roundabout are not necessarily the opinion of the IPENZ Transportation Group or the editor, except the editorial of course. There is no charge for publishing vacancies for transportation professionals, as this is considered an industry-supporting initiative.

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or c/o Auckland Transport, Private Bag 92250, Auckland 1142

Roundabout is published around the 15th of March, June, September and December each year, and contributions are due by the 10th of each publication month.

A monthly Mini-Roundabout email update is circulated on the 15th of in-between months and contributions are due by the 12th of each month.

If somehow you have come to be reading Roundabout but aren't yet a member of the IPENZ Transportation Group, you are most welcome to join. Just fill in an application form, available from the Group website:  
<http://ipenz.org.nz/ipenztg/files/TGApp.pdf>

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# Editorial



I'm probably a terrible person to go on holiday with.

I spend a lot of time observing and photographing the transport system of wherever I am. Noting the differences, wondering why things are done that way and then considering whether we could try it in NZ.

So that's how I ended up with this edition's cover story. It's my recollection of

my recent holiday to Vietnam, Singapore and Malaysia. I have a lot of family photos at zoos, beaches and Legoland, but I have also compiled a bunch of photos of transport stuff.

Some are funny, some are interesting, some are thought-provoking. In Ho Chi Minh city, I was struck by a real sense of observing a completely different cultural approach to sharing streets.

Not just about all the domestic activities that took place on the street (and if you can think about any activity

Different ways of setting out the street, different ways to interact with other road users, different expectations as to the way we should be able to move around. I'll give you a clue: slower and more organically seems to have some advantages.

Read my article, have a think about observations you may have made whilst on holiday and feel free to let me know if it raises any ideas that you feel may be worth sharing. (Amusing photos are also appreciated)

As well as unnecessarily learning, I also saw some sights in Vietnam I never expected. My favourite was a bridge that was so low that I could drive under it but not walk under it (it was 1.7m clearance and I'm 1.8m tall).

I also kept a running list of items I saw being carried on the back of a motorbike. These included:

- Ladders
- Mega cartons of toilet paper rolls
- Fridges
- Families
- Sheets of corrugated iron
- Trees
- A boa constrictor

Overall I'd highly recommend Vietnam as a destination - the people were the friendliest I've met anywhere in the world - and an amazing experience for people who



*My favourite was a bridge that was so low I could drive under it but not walk under it (it was 1.7m clearance and I'm 1.8m tall)*

that happens in a house, it was observed on a Vietnam street), but of the calm fluid way people moved around in a fairly unstructured environment.

It challenged my assumptions that a more orderly and well set out road network would automatically be more efficient and safe. It got me thinking about whether there are learnings we could take, and different approaches we could try.

aren't distracted by watching the traffic. So I'm told.

I have also collected a couple of other Vietnam articles, to prove I wasn't making it up!

**Daniel Newcombe**  
**Roundabout Editor**  
**@newcombe\_dan**



# Chairman's Message



Greetings from Canada. I started developing this message at 40,000 feet somewhere over the Pacific Ocean. As you read this (I am sure some of our members do!) I am on a long-awaited break somewhere in the beautiful city of Vancouver. I have fully switched off from work mode so I hope this message does not reflect that.

Prior to my leaving, everyone I spoke with who had been to Vancouver said that this was their favourite city or the best city in the world. I have just been here for a couple of days and can only concur with that sentiment. It does have a sense of place. I have yet to fully enjoy what this lovely city has to offer.



I am looking forward to seeing and using the city's much-talked about cycle network and other aspects of its passenger transport network.

It seems that one common trait among most (if not all) of our colleagues when we are on holiday is the number of photographs we take of transport-related infrastructure [Hey, that's what I was saying - Ed]! I am sure that most of our families roll their eyes each time we suddenly stop while walking or driving around –

especially when they are in a hurry to get somewhere.

A few weeks ago, I found out that the city is hosting a conference on placemaking. Unfortunately, I shall be away from Vancouver on the same days of the conference. I am disappointed as I would have liked to pop in for a few hours to take in some of the current thinking and ideas in making cities more people-orientated and more people-friendly.

IPENZ is currently undertaking initiatives with regard to the government's intention to increase the number of engineers enrolling at and graduating from our universities. There is also the momentum to increase the uptake of the STEM (science, technology, engineering and mathematics) subjects.

Compared to other countries with strong emphasis on technology, New Zealand produces a disproportionate amount of technical graduates. This is not dismissing other vocations. This is an increasingly competitive and 'disruptive' world and we need to

produce a greater number of technical graduates to be at the forefront of new developments.

However, recently there has been a push towards the STEAM (the 'A' being the arts) agenda. It is felt that science and technology graduates would benefit from inclusion of/exposure to the arts. This thinking and approach can only be of significant benefit to technical graduates.

In today's environment, a well-

rounded education and more simply well-rounded professionals are required in our search to develop access instead of mobility and places instead of sterile and vehicle-dominated areas of increasingly valuable real-estate.

Our discipline was previously the domain of engineers. Traditionally, engineers are numbers-focussed and were not concerned with business aspects and the softer skills. I believe this is the key reason engineers 'lost control' in the decision-making process relating to transportation infrastructure.

It is only in recent times that the transportation profession has had such a high proportion of 'non-engineers'. In my humble opinion this has been a huge benefit to the transportation profession. In my experience, this has brought a different perspective to the discipline. The cross-pollination and challenge to traditional engineering thinking has been stimulating and refreshing.

Nevertheless, it is vital that the emphasis on the STEM subjects is developed at the early years in school and maintained throughout the school years.

Another initiative, recently started by the AUT, is a research project on writing and communication. This was based on observations of poor writing and communication skills of engineering students.

This project commenced with a survey that initially covered undergraduates but the survey was extended to our profession. The survey was distributed to our members. I hope you participated.

If you have the opportunity to participate or contribute to the above, please do not hesitate to offer your experience, skills and knowledge.

The bulk of a busy year has passed by, spring has arrived and our thoughts are already turning to end-of-year functions and summer break.

Go forth and spread the STEM/STEAM messages.

**Pravin Dayaram**  
National Committee Chair





## Safe Sustainable Future

IPENZ Transportation Group Conference 2017

29 - 31 March 2017  
Distinction Hotel, Hamilton

Mark your calendars now for the next IPENZ TG conference!

### Special dates of interest

- Abstract submission closes  
14 October 2016
- Abstract acceptance notification  
4 November 2016
- Registration opens  
December 2016
- Early bird registrations close  
February 2017

### Early bird registration fees 2017 (including GST)

Full	\$975
Single day	\$550
Life member	\$0
Student full	\$345
Student day	\$115
Young prof full	\$690
Young prof day	\$230
Exhibitor	\$575

### Programme

The first day of conference will kick off with technical tours highlighting relevant projects in the Waikato area. The following two days will be a mix of plenary and concurrent sessions.

We are calling for abstracts now, relevant to the conference theme **Safe Sustainable Future**. For further information please visit [the abstract page on the website](#).

### Networking events

As usual there will be a welcome function on the Wednesday evening giving opportunities for delegates to network and create future opportunities for collaboration.

We hope you can also join us at the conference dinner, on Thursday evening at "real Middle-Earth" Hobbiton movie set, Matamata. This is an opportunity rarely afforded to many.



### Sponsorship opportunities



We wish to acknowledge the contribution of our sponsors, past and present, whose contributions are instrumental in helping us run what we hope are stimulating, rewarding and enjoyable conferences.

We have added some new packages and these are available on the conference website.

Should you require further details, please contact [Harding Consultants](#).

[www.ipenztgconference.co.nz](http://www.ipenztgconference.co.nz)



Keep up to date with IPENZ Transportation Group happenings:

[www.ipenz.org.nz/ipenztg](http://www.ipenz.org.nz/ipenztg)

[www.twitter.com/ipenztg](https://www.twitter.com/ipenztg)

[www.facebook.com/ipenztg](https://www.facebook.com/ipenztg)



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TRANSPORTATION GROUP





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or call 0800 252 627





## Wainuiomata traffic island botch-up

Stop-go traffic management was necessary around a traffic island after a botch-up by roading contractors in Lower Hutt.

The traffic island was installed in Parkway, Wainuiomata, in late August as part of plans for a new housing development. The plan had been approved by Hutt City Council, yet contractors made "a mistake" by installing a concrete traffic island before widening the road, a council spokeswoman said.

A lane was closed and road workers directed traffic through the spot while a digger worked on the site.

"Stop-go management was part of the road-widening plan. The temporary traffic management plan in place at the moment is on top of the planned stop-go management to account for the island being placed before the road-widening happened."

The community has voiced its horror over the fact the island was plonked on the road, cutting right into the left-hand lane. Wainuiomata councillor Campbell Barry said if anything, the whole situation was a "lesson in common sense".

"It doesn't take a rocket scientist or even a roading engineer to know you don't put a traffic island in before you widen a road."

Both council and Barry were adamant the botch-up resulted in no extra cost to ratepayers.

"That [cost] is all on the developers," Barry said.

The island is intended to allow vehicles to turn into the new development, once it's complete, without slowing down traffic.

## New York's Metropolitan Transportation Authority joins NACTO as first public transport member

National Association of City Transportation Officials (NACTO) President Seleta Reynolds, NACTO Chair Janette Sadik-Khan, and Thomas F. Prendergast, the Chairman and Chief Executive Officer of the New York Metropolitan Transportation Authority (MTA), North America's largest transit agency, have announced that MTA has joined NACTO as its first transit agency member.

NACTO's new transit agency membership category reflects the essential role of convenient, accessible public transit in creating sustainable 21st century cities. By joining NACTO, MTA demonstrates the role of street design in making urban transit more reliable and its vital importance for the next generation of transportation leaders.

In addition to its more than 6 million daily subway riders, the MTA moves 2.4 million bus passengers daily.

To improve service, the MTA works closely with the NYC Department of Transportation (NYC DOT), the agency in charge of the vast majority of New York City's streets, helping design and build dedicated transit lanes, integrated passenger boarding areas, and curbside service features that accelerate boarding and fare payment. MTA joins NACTO as American cities from Houston to Los Angeles to Seattle to Chicago are investing in innovative new bus networks, providing proven street design examples for a growing network of transit operators.

"Putting people and transit at the centre of our cities' streets makes city streets work better for everyone," said Seleta Reynolds, General Manager of the Los Angeles Department of Transportation and NACTO President. "Combining the strengths of transit agencies with street departments allows our cities to elevate transit with world-class street design."

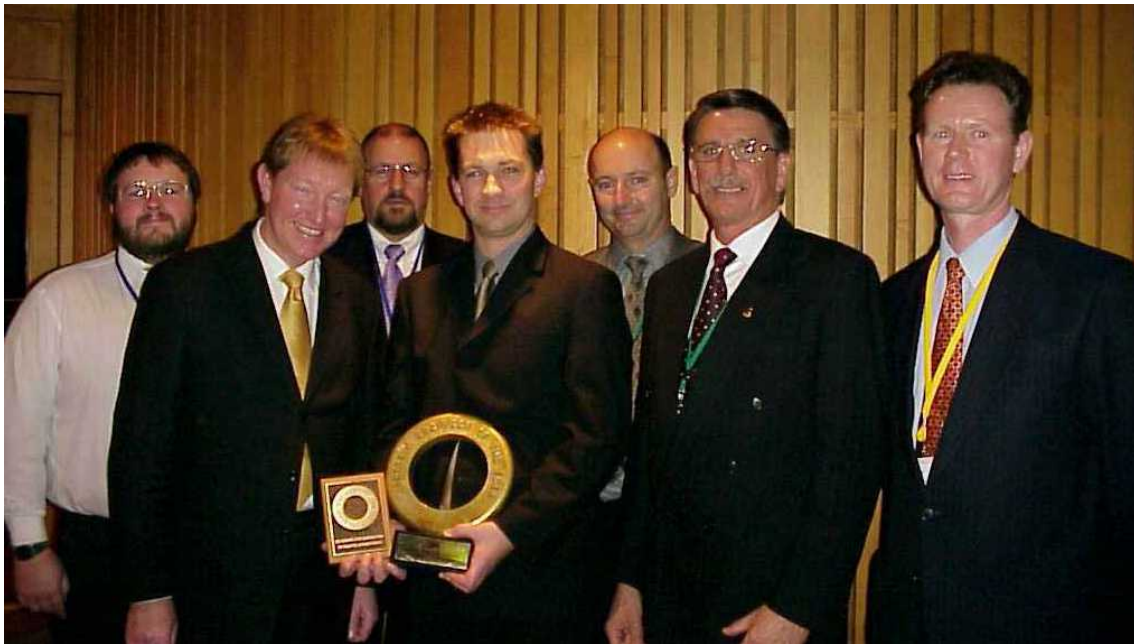




3M Traffic Safety Innovation Award

# Whatever happened to that 3M Award winner...?

## 2004 3M Traffic Safety Innovation Award winner - Blair Monk

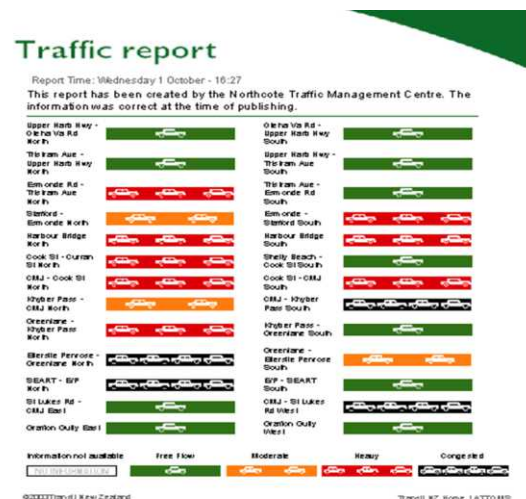


Auckland in the early 2000's was becoming a very congested city. I was Traffic Operations Manager for Auckland and Northland for Transit New Zealand. I wanted to get the message out to the public about what congestion there was on the motorways and where the incidents were. Traffic reports on the radio were irregular and often out of date, but at the time, were the only way to get traffic congestion information out.

I had been looking around the world at ways to get traffic congestion information out to the public. My theory was that if you told people where the problems were, they would avoid the area and therefore help fix the problem of secondary congestion. It also meant we would have happier drivers on the road and less overall delays.

I wanted to tell emergency services what was going on and to get better updates to radio stations, truck operators, bus operators etc. In those days the internet was new so not everyone had it; so we set up a messaging service via fax machine for regular traffic reports and major crashes. Faxes didn't have colour, so with limited options to tell people what was going on we used queues of cars icons to denote the congestion levels. After a while the number of people that wanted the information outgrew the ability to get the faxes out to all of them.

I started with the idea of using the new "interweb thingy". I wanted the traffic operators at the new ATTOMS Traffic Management Centre to fill in a map of the Auckland motorways that I could show green, orange, red and black for free flowing, moderate flow, heavy flow and congested. These traffic conditions could be seen by the ATTOMS Operators from the control room cameras but at the time there were only four Variable Message Signs on the motorway network to tell the travelling public about what was going on and where.





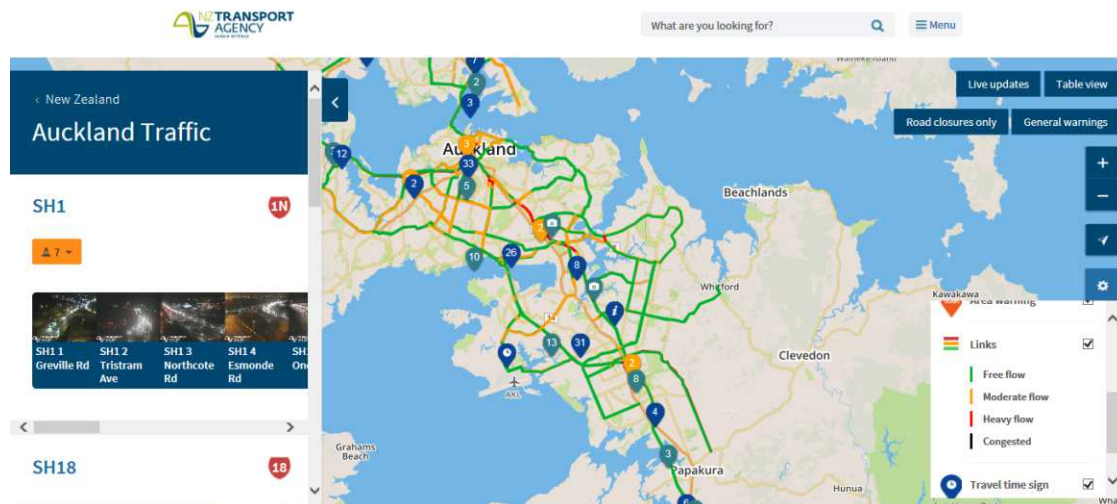
It took quite a lot of lobbying to get funding and explain what we were trying to do. But approval was given and development started in earnest.

The first day the website went live was quite nerve wracking but it all went well. It only covered the central motorway areas. We only had about seven webcams and our congestion graphics along with incident icons to tell the public about roadworks or a collision. The Traffic Website was a hit and at the time got rave reviews. [www.trafficnz.info](http://www.trafficnz.info)



The Transport Agency's Traffic Website has gone on to become a vital link in the communication network to drivers. The number of webcams has increased from the original seven to more than 70 covering all the Auckland motorways. There are a number of traffic congestion monitoring sites now with both arterials and motorway coverage. They are far more automated these days with loops, radars and cell phones telling the systems where congestion is and calculating predicted travel times. The Website has been expanded to cover many areas of New Zealand and is being constantly updated. I'm pleased how it has grown.

Now there is a lot more Intelligent Transportation System (ITS) equipment out on the roads to advise the public. People get text, SMS alerts etc which are far more frequent, more up to date radio and TV reports, live feeds from cameras, real time journey times that are continually updated along with a myriad of apps for your smart phones. There is a whole team in the Traffic Operating Centre focused on this area of business. The benefits are a more informed public, happier drivers, faster emergency services response, better public transport: people now have options!



To enter the 3M awards, I had to show innovative thinking, innovative technology, proactivity, sustainability, applicability and effectiveness and submit a report to the evaluation committee. I made the finals and was required to present to the IPENZ conference in Wellington. I was so nervous I completely mucked up my presentation and I think confused a few people. I became very depressed and walked along the waterfront with a friend consoling me that it didn't really matter and the work I had done would be good for Auckland anyway.

At the dinner at the Beehive, I was extremely surprised to get the award. The evaluation committee saw the merit of the project and its potential.

The prize from 3M was amazing! At the time it was up to \$10,000 travel to the USA to visit 3M headquarters and learn more about transport.

3M helped me plan my trip and opened a number of doors. I started in San Francisco and visited the traffic management centre that controlled the Golden Gate Bridge. I went to the ITE World Congress in Las Vegas including visiting the Hoover Dam and Grand Canyon. I toured the traffic management centre in Las Vegas and did a technical training course on the different public transit options used in that growing city.

I then went to 3M's headquarters in Maplewood just outside Minneapolis St Paul. I met with some of the management and was able to see some of the latest innovations 3M had to offer. This included day and night drives on the test track that had been specially snow ploughed for me.

I was treated like royalty with limo drivers for every connection and I even managed to stop in Colorado on the way home a fit in a bit of skiing! I ended my tour with a tour of the Los Angeles traffic management centre, which I remember at the time, had a large number of helicopters for incident management!

New Zealand in the early 2000's was pushing the envelope for traveller information systems and traffic control centres. We were good, but there was always more to learn by looking around at what others were doing, like ramp metering, but that's another story.

I would like to thank 3M for the support they have given the Transportation Group of IPENZ, and I would like

thank the committees that make it all possible. It is a great example of how 3M's support has gone on to make innovative things grow. Technologies continue to advance so we will need to keep thinking ahead and keep researching into new and better ways of doing things that make our lives better.



# Vacancy



## INTERMEDIATE TRANSPORTATION PLANNER/ENGINEER

Wellington

*Do you want to grow your career and be involved in projects of national significance?*

Due to increasing workload, a great opportunity has become available for an experienced Transportation Planner/Engineer to join our Southern Design Centre Transportation Asset Development (TAD) Team based in Wellington City. The focus of this role is to provide technical advice and the effective management of clients, staff and projects.

**Key responsibilities would include:**

- Participating in the planning and scoping out of projects for the Transport Asset Development (TAD) team
- Undertaking investigations and inspections, and assisting in developing projects through applying appropriate analysis
- Assisting with the preparation of reports including assessment following the Business Case model approach
- Providing technical support and guidance to junior team members
- Produce research, feasibility studies and subsequent reporting suitable for client presentation.

We are looking for a client focused, enthusiastic self-starter who enjoys a challenge and a great team environment.

**To be successful in this role you will need:**

- A Bachelor of Engineering (Civil) or similar, ideally working towards becoming Chartered
- At least five years' professional experience in the transportation field
- Ideally previous experience working in a consultancy environment, dealing with local council / NZTA and key stakeholders
- Experience in carrying out critical analysis of transport data, technical assessments and business case work
- Land use development and sound understanding of the Resource Management Act processes would be useful
- Excellent interpersonal, communication, report writing and client management skills
- Project Management skills
- Ability to guide/coach junior staff
- Current clean drivers licence.

**About Opus**

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Close Date: Wednesday 28th September 2016



*Fun fact: Thimphu, in Bhutan, is the only capital city in the world without traffic signals.*



*Christchurch transportation professionals visiting Auckland for the 2WalkandCycle really appreciated the placement of a drinking fountain at this major intersection, as the time it takes to cross the road causes dehydration!*



# Active Modes Infrastructure Steering Group (AMIG)



The Active Modes Infrastructure Steering Group (AMIG) is a national working group originally established to consider whether there is a need for new signs and markings for cycle lanes and sharing traffic lanes. A technical group has now evolved to identify and discuss all technical guidance associated with planning and design of cycling facilities and further develop and promote consistent implementation of best practice guidance.

Find out more about the group [here](#).





In February, I was awarded the AITPM New Zealand Study Tour Award for 2016, which was a huge privilege. The award allowed me to attend the IPENZ Transportation Group Conference in Auckland, from 7th to 9th March.

AITPM is the Australian Institute of Traffic Planning and Management Incorporated. It is a leading industry group which provides a platform for professional development and information sharing. Essentially, AITPM is a reciprocal group to the IPENZ Transportation Group.

I have been involved with AITPM since 2013 when I received the QLD Young Professional Award. Since then, I was voted in as state branch secretary, a position I have held since mid-2014. At a branch level, the institute holds monthly technical sessions, half day seminars and annual breakfast/dinner events. At a national level, the flagship event is the annual National Conference where members and non-members alike come from across the country and internationally to participate in the leading traffic and transport forum in Australia.

This year's conference was held in Sydney from 26-29th July, coinciding with AITPM's 50th year anniversary. Peter McCombs, an IPENZ TG Life Member, was invited to be keynote speaker. With two full days of presentations, covering traffic engineering and management, transport planning and transport modelling, there was something for everyone. The final day offered a choice of a multi modal tour around Sydney, an active transport workshop or a modelling workshop with international guest Tom van Vuren.

Hopefully, this year's AITPM conference will be as successful as the IPENZ Transportation Group conference. Special mention to Daniel Newcombe, the conference convenor, who organised the event. With a plethora of keynote speakers, the presentations focussed on planning for the future of transport in Auckland and wider New Zealand. The fundamentals of these learnings however could be applied universally and I will undoubtedly be bringing the knowledge that I gained back to my work and AITPM.

I would like to thank AITPM for providing this opportunity and the IPENZ Transportation Group for holding a great forum. The experience has been insightful and I will certainly be applying the learnings from the conference in my work role. Being able to better understand the IPENZ Transportation Group structure and culture will hopefully allow for stronger connections between the two groups for future collaborations.

**Alice Shi, AITPM**



AT's Adam Moller sent this through. It must be interesting to see this straight road suddenly become curvy when it rains...

# Transportation Engineering Postgraduate Courses 2017 (Provisional)



The University of Auckland  
NEW ZEALAND



NZ TRANSPORT AGENCY  
WAKA KOTAHĪ

Department of Civil & Environmental Engineering University of Auckland  
For Master of Engineering Studies [MEngSt] and Post Graduate Certificate [PGCert], with  
/ without Transportation specialisation, or for a one-off Certificate of Proficiency, COP

## Semester 1 (Mar-Jun 2017)

<b>CIVIL758 – Traffic Systems Design (3hr / w for 12 weeks, dates TBA)</b>	Traffic signal timing analysis, gap acceptance parameters, intersection analysis of performance (priority, roundabouts, signals), introduction to transportation planning and modelling techniques, Resource Management Act and other requirements, computer modelling and simulation.
<b>CIVIL762 – Transportation Planning (2 x 3 days, dates TBA)</b>	In-depth exploration of various components of the urban transportation planning process, with emphasis on theories on modelling. The principles of conventional four-stage transport planning model, namely, trip generation, trip distribution, modal split and trip assignment, are covered in detail.
<b>CIVIL766 – Road Asset Management (2 x 3 days, dates TBA)</b>	Road asset management concepts, levels & functions; data requirements; evaluation of functional and structural performance; deterioration modelling; economic evaluation and lifecycle analysis; prioritisation and optimisation; risk management; pavement management systems.
<b>CIVIL769 – Highway Geometric Design (2 x 3 days, dates TBA)</b>	The geometric design of highways including; user, vehicle, road environment, sight distance, vehicle speed, safety, safe systems & design consistency, horizontal / vertical curve & cross-sectional design, plans, signs & marking.
<b>CIVIL770 - Transport Systems Economics (3 x 2 days, dates TBA)</b>	Fundamentals of transport economics incl. supply, demand, pricing, congestion and other externalities; principles of economic evaluation in transport planning.

## Semester 2 (Jul-Oct 2017)

<b>CIVIL759 – Highway &amp; Transportation Design (Mon 11-12 and Wed 12-2 for 12 weeks)</b>	Economic and environmental assessment of transport projects, land transport funding, road safety engineering, crash reduction & prevention, design of at grade intersections, pavement asset management and rehabilitation techniques, heavy-duty pavements, highway drainage.
<b>CIVIL765 – Infrastructure Asset Management (17, 18 &amp; 19 Aug and 5, 6 &amp; 7 May)</b>	Integration of planning and infrastructure asset management, resource management, institutional issues and legal requirements. The process of undertaking asset management plans and specific asset management techniques across all infrastructural assets.
<b>CIVIL 771 – Planning &amp; Managing Transport (1 &amp; 2 Aug, 12 &amp; 13 Sept 17 &amp; 18 Oct)</b>	Integrated planning of transport and land use, Outline of transport planning modelling, LTMA and the GPS, District Plans and RMA, Travel, trips and parking. Transport assessments and multi-modal transport, Travel demand management, 'Smart roads', Intelligent transport systems.
<b>CIVIL 773 - Sustainable Transport: Planning and Design (3 x 2 days, dates TBA) (new course / under development)</b>	Pedestrian and cycle planning and facility design using best practice (network and route planning, trails, roundabouts, footways, terminals, plazas, footways, escalators, etc.); public transport (bus, rail and LRT) and vehicle operations for compact central urban areas and transit orientated developments, shared spaces and user safety in design assessments.

NOTE: Other relevant courses at the University of Canterbury (e.g. Civil / Transportation) or at Auckland (e.g. in Civil / Construction Management) or elsewhere can be suitable for credit – prior approval is required.

For Admission / Enrolment inquiries contact: **Assoc. Prof. Roger Dunn**, Director of Transportation Engineering  
Phone: (09) 373-7599 x87714 or (09) 923 7714 DDI Email: [rcm.dunn@auckland.ac.nz](mailto:rcm.dunn@auckland.ac.nz)

Further details, including the course outlines, can be found at:

<http://www.cee.auckland.ac.nz/uoa/home/about/ourprogrammesandcourses>

<http://www.engineering.auckland.ac.nz/uoa/home/about/our-staff>



Calling all infrastructure & transportation specialists

# Auckland Transport Infrastructure FORUM

19-20 September 2016  
Pullman Hotel, Auckland



JOIN THE DEBATE AND DISCUSS THE HOTTEST TOPICS FACING AUCKLAND'S FUTURE, INCLUDING:

- Auckland Transport Alignment Project
- Port Future Study
- Auckland Unitary Plan
- National priorities for Auckland's transport

AND PANEL DISCUSSIONS ON:

- Optimising rail networks
- Ask your future mayor
- Impacts of alternate transport infrastructure
- Why aren't we doing more with PPPs in Auckland?



Supporting Organisations:



Supporting Media:





## Dates:

Wednesday 21 Sept 1-5pm

Thursday 22 Sept 9-12noon

Friday 23 Sept 9-12noon

## Application deadline:

Friday 16 Sept

## Venue:

Data Visualization Laboratory,  
Room # 903.251  
Newmarket Campus,  
314-390 Khyber Pass Rd,  
Newmarket, Auckland

## Who should attend?

NZ Transport Agency,  
Auckland Transport,  
Practitioners in Traffic  
Engineering

## Cost:

For students enrolled in Civil  
761 course, there is no cost.

For all others, the cost for the  
three half day's seminar is  
\$500 (includes finger food  
lunch on 22 and 23 Sept)

## Contact person:

Dr Prakash Ranjitkar, Email:  
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## Seminar on Modelling and Simulation of Transport Facilities

This three half day's seminar series is a part of the Transportation Engineering Group's taught Master Programme at the University of Auckland. The seminar is largely focussed on modelling and simulation of transport facilities and their applications in intelligent transportation systems (ITS). It takes advantage of Prof Benjamin Heydecker's visit to the University of Auckland from the University College of London.

### Seminar content

1. Traffic signal design and operations
2. Traffic models and simulation
3. Microscopic models
4. Macroscopic models

### Speakers

**Benjamin Heydecker** is the Professor of Transport Studies, Department of Civil, Environment & Geomatic Engineering, University College London.

Ben is one of the leading researchers in the world in developing mathematical and statistical analyses in transport studies. He has pursued this along three broad themes within the field of transport studies including transport safety, traffic management and control, and transport planning methods. He is a Fellow of the Institution of Mathematics and its Applications, Fellow of the Royal Statistical Society, Fellow of the Transport Research Foundation and Member of the Chartered Institution of Highways and Transportation. He holds a PhD in Transport Studies and is Chartered as a Mathematician, Statistician and Scientist.

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**Prakash Ranjitkar** is a Senior Lecturer in Transportation Engineering in the Department of Civil and Environmental Engineering, University of Auckland.

Prakash is coordinating this seminar and lecturing on the Civil 761: Planning and Design of Transport Facilities course. He has undertaken a wide range of research and consulting projects in over 20 years of his academic and professional career. He has strong research interests in modelling and simulation of traffic, intelligent transportation system, traffic operations and management, traffic safety, human factors and applications of advanced technologies in transportation.

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# Cover Story: What can we learn about transport from Vietnam?



**Daniel Newcombe, Roundabout editor**

I recently took a family holiday through Vietnam, parts of Malaysia and Singapore. Being an inquisitive transport professional, I couldn't help observing and photographing interesting signs, roads, vehicles and travel behaviours.

I apologise in advance for the blinding obviousness of my observations but it struck me – for a range of different reasons – we could learn a lot about alternative ways to design and operate our roads from the inhabitants of Ho Chi Minh City.

It's as much about road user behaviour as road design or rules. What I came to realise – and maybe this should have been more obvious to me - was that when there is not enough room for everyone, there is a shared need to co-operate on the way you travel and what mode you use.

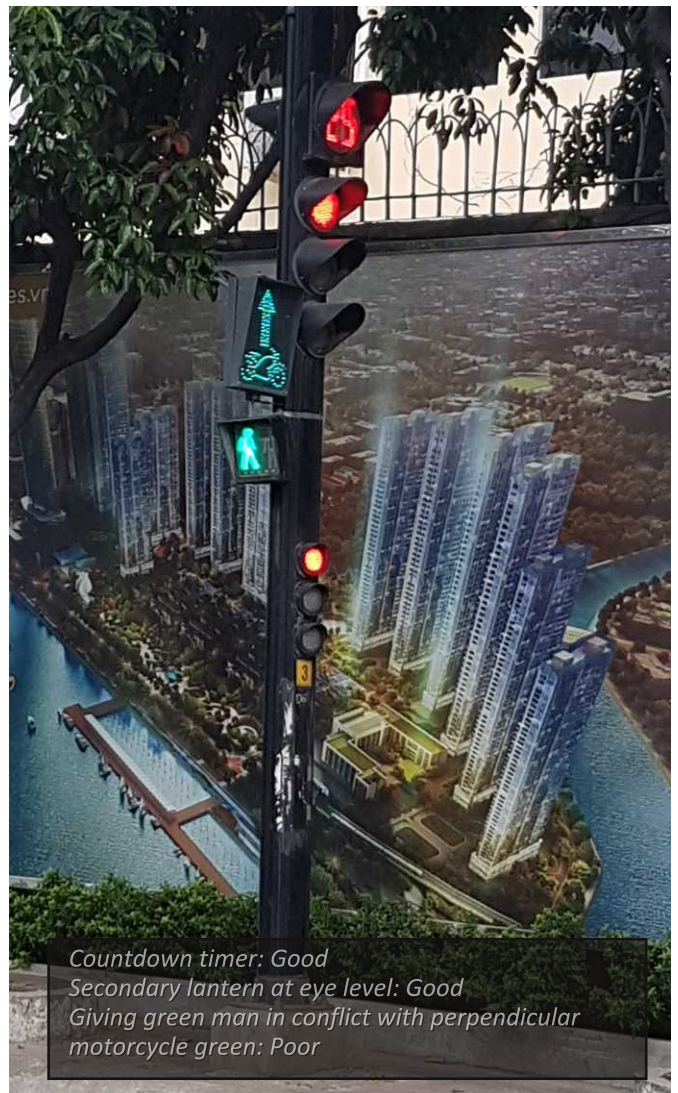
This is not something that can be mandated or designed for, it is something that the travelling community must adopt and embrace by itself. I don't think signs, line-markings or technology will do it.

My first observation from Ho Chi Minh City (Saigon to its friends) was the abundance of small motorbikes and relative lack of cars and buses (more on that later).

There are tens of thousands of motorbikes constantly flowing through the fairly narrow streets of the city, usually not stopping at red lights or stop signs (actually I liked the common use of traffic signal countdown timers and small secondary lanterns on the signal poles at motorcyclist eye-level), and almost never giving way.

And often travelling the wrong way up a road. And carrying numerous passengers or large items (see photos). There are lane markings, but they are fairly ad hoc and seem to be used only in a loose advisory sense.

My friend who lives in Ho Chi Minh described the flow of motorbikes as being 'like fish'. They move in amorphous groups and don't stop, they just slow slightly and move around obstacles. Riders tend to travel a couple of metres out from the kerb, as vehicles entering from sidestreets just pull out and expect to be able to merge into the slow-moving school of bikes.



Countdown timer: Good  
Secondary lantern at eye level: Good  
Giving green man in conflict with perpendicular motorcycle green: Poor





Thinking about it – of course people are accommodating to others around them; they (and their family travelling with them on the back of the bike) are quite vulnerable and so happily move slowly and safely around. It's a shared sense of co-operation. Horns are used, but usually in a friendly hey-I'm-just-behind-you-in-your-blindspot kind of way.

The smooth, almost fluid way motorcycles flow around the narrow city streets is fascinating to watch. And terrifying to travel through on the back of a motorbike – which I braved a few times. Actually it isn't terrifying once you realise you don't need a large 'personal safety space' around you, and that collisions are easily avoided by just slowing, maybe beeping the horn, and flowing around the obstacle. The low speed and the lack of aggression is the key.

So motorcycles are fish. Buses – the few that there are – are described as behaving 'like whales'. They are the largest and least manoeuvrable vehicles, so they just slowly travel to where they are going – everyone else just moves around them.

Cars are probably best thought of as sharks – they are big and dangerous enough to keep you nervous. People tend to keep a wary eye on them, as cars are harder to wriggle through the seething mass of humanity and household goods that travel Ho Chi Minh streets.

Now someone will tell me that the travelling behaviour I observed is due to the Vietnamese communist system enforcing obedience and compliance, and financially restricting people to only being able to afford bicycles



or small motorcycles. That may well be true, but the way they travel is an organic phenomenon rather than an imposed system.

Most importantly, the lack of aggression makes it work. If road users reacted negatively – beeped their horn loudly, tried to 'claim their space' – to having their movement interrupted, the whole system would break down.

I was constantly amazed with the calm acceptance that riders and drivers showed when their path was interrupted in some way. But then, they would like the same thing for themselves if the position was reversed.

I thought about the comparison to NZ, where the most common reaction to someone encroaching into your line of travel is to aggressively sound your horn, often accompanied by adult-themed hand gestures and some yelling (whether the other driver can hear you or not).

We are sometimes told in the media or by overseas visitors that NZ has the worst drivers in the world. I don't believe that, but we are certainly far more aggressive and less co-operative than our Vietnamese equivalents.



The ironic thing I found from the chaos of Ho Chi Minh was the relative lack of fully stopped queues. Sure, everything moved slowly, but it moved. Slowly, but constantly. By comparison, much of my travel around Auckland involves freeflow travel followed by being at a complete stop for a few minutes, then more travelling at the speed limit for a short while, followed by more sitting in a queue.

Overall, I'd be surprised if the average speeds between downtown Auckland and Ho Chi Minh were much different.

One of the key elements of the functioning of the Ho Chi Minh city streets is the relative lack of cars and larger vehicles. But my friends say even in the last couple of years they have seen more cars on the streets and that this has had a noticeable effect on traffic movements, as motorists are less able to follow the organic, lets-informally-slip-around-each-other approach of motorcyclists and cyclists.

It is easy to envisage a point in the future where the current co-operative approach breaks down due to the (even slightly) higher number of cars blocking the ability of motorcycles to 'swim' through the streets.

And where more modern parts of the city are being designed and built with cars in mind – with motorways,



*The modern highways sit incongruously with the older parts of Ho Chi Minh*



multiple lanes, lots of space – it is already apparent that ‘old Vietnam’ doesn’t quite work. The higher speeds of cars and the relatively dispersed spread of motorcycles breaks down the dense, co-operative nature of Vietnamese travel.

I suspect the higher vehicle speeds and distances between road users mean that eye contact is harder to gain and the higher speeds make people more cautious than when surrounded by motorcycles on narrow streets.

Let me say upfront that I wouldn’t call many of the Ho Chi Minh streets ‘safe’ for travelling but I certainly felt less safe on the higher speed, less busy modern roads.

Higher speeds and more space seem to be fatal to the co-operation of road users and the slow and safe mixing of different vehicle types.

Thinking about how this relates to NZ’s traffic engineering approach, well, we spend a lot of time delineating wide smooth lanes to allow vehicles to



*The use of road markings sometimes left a lot to be desired. If you can't see what's wrong with this photo, shame on you.*

independently operate at high speeds and have plenty of separation from other road users.

The Safe System approach aims to have roads that have sufficient room to allow users to go off-course and correct errors without causing a crash. This potentially encourages users to travel at higher speeds and pay less attention to others, as they know they have a buffer.

I’m not saying we’re doing it wrong, it is just interesting to see that ‘uncontrolled’ and ‘unsafe’ ways of travelling can actually appear to work well and have their own merits.

The Ho Chi Minh approach is similar to that of shared spaces, which are increasingly popping up around NZ. The idea behind shared spaces being uncertainty causing street users to slow their travel, make eye contact with each other and operate without clear priority to anyone. This is more or less my Vietnam experience, but on a city scale.

Another challenge I noted resulting from a growing number of cars is the way footpaths are used. Generally they aren’t for pedestrians. They’re for parking motorbikes, running roadside eating establishments, storing household goods, and undertaking all manner of domestic or commercial enterprises.

Walking is generally undertaken on the road carriageway (where many of those activities also occur – cooking, eating, selling). If there are more cars on Ho Chi Minh streets, they won’t be able to park on the



footpath like a motorbike, so they’d have to be on the roads (there seems to be relatively little off-street parking available in established parts of the city). This is where the pedestrians and many of the motorcyclists are. Parked cars will narrow up the already narrow roads. It doesn’t seem like it will be a positive outcome.

Right, to Singapore.

If you ever want a clear comparison to Vietnam, it’s Singapore. Highly controlled, highly car-orientated, highly obedient drivers. We travelled to Singapore for a few days and the contrast to Vietnam was astounding.

Singapore is designed around the car. The prevailing culture is that affluent people drive the massive multi-





*This railway level crossing was on the main route from Ho Chi Minh airport. When a train arrived, to stop traffic, some nice blokes pulled across the thin red and white railings sitting to the right side of this photo.*

lane roads to large parking buildings and access internal malls to shop, to then drive to the next internally-focused destination. I found it very sterile. From air-conditioned car to air-conditioned mall.

By comparison, NZers spend a lot of time walking around outside and between activities. Some of this is explained by the Singapore climate – goodness me it can be hot and humid – but it really is the result of a comprehensively planned car culture. Even with an excellent and expanding MRT system zooming people around underground, the surface of Singapore seems designed for cars.

In fairness there are a lot of pedestrian overbridges and underpasses, but I didn't see a lot of pedestrians. I noted a lot of signs warning pedestrians not to cross the road but few opportunities to do so, and often footpaths had very narrow, inaccessible designs (universal access advocate Bridget Burdett would have conniptions).

I observed that not only are there lots of traffic lanes, they are also generally quite narrow (maybe 3.0-3.2m on average, wider on motorways) so this leaves no room for passing bicycles or motorbikes within the lanes.

Whether this is the reason or not, there are very few cyclists or motorcyclists (I only saw three cyclists in four days). I was told that cyclists get bullied off the roads and resort to riding on the footpaths. As a result, there is a new government initiative to fine footpath cyclists for endangering pedestrians.

Where Ho Chi Minh was organic and lively, Singapore was rigid and sterile. Thriving economically, clearly, but where Vietnam had people in every direction, Singapore had cars wherever you looked.

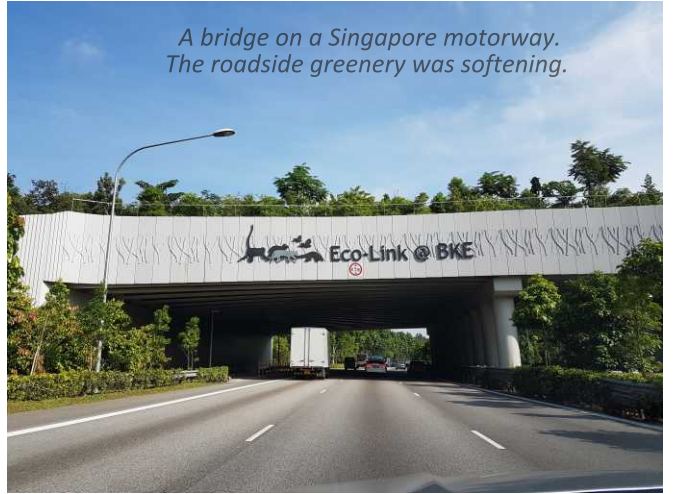
Reading the local papers, I noted that parking fees were being raised (by 20%!) for the first time in 14 years, in order to discourage driving. Having built a city for cars, Singapore is now aiming to become 'car-lite'. The future for Singapore apparently holds fewer cars and less but more expensive parking.

The local papers also described that Downtown Line 2 MRT ridership had tripled since it was extended but the media noted that affluent residents were still continuing to drive (this seemed to be because of issues with first/last leg access).

Transport planners were suggesting that a bike hire scheme be put in, which is ironic given how super unfriendly the roads are for cycling.

Singapore wasn't all negative for me. I was reminded how lush and green we could make our motorways, if we planted out the berms and medians with trees and low bushes, and let this vegetation surround the concrete and steel barriers. Driving along Singapore motorways was often like driving through a well-kept jungle. I am sure it has a high maintenance cost and Health & Safety issues, but it really softens the road environment.

To conclude, I observed what I thought was a good idea from a quick trip into Malaysia. At some of the motorway work sites – where high speed traffic zoomed past maintenance workers protected by not much more than road cones – some set ups also included a mannequin dressed as a roadworker at the start of a work site. Presumably drivers pay more attention to what seems like a person standing in the motorway lane than a road cone or sign. Have we tried that here?



*A bridge on a Singapore motorway. The roadside greenery was softening.*



# BELIEVE IT OR NOT: LAWS OF THE ROAD



It's not difficult to recognise the anarchy of Vietnam's road system - it pretty much slaps you in the face as soon as you walk outside! What is an issue is recognising the rules in all this chaos. What regulations should we all know and follow when riding the roads? Apart from the general rule of "don't do anything unexpected", there are quite a few laws and formalities that, believe it or not, are applied and enforced every day.

## 1. Crossing the street

According to Article 32 of the Vietnamese Law on Road Traffic, pedestrians may cross the road at a traffic light, a specific road marking, or otherwise when it is "safe" to cross. You can't walk over a median strip, and if you are a child under seven you can only cross traffic if you're with an adult.



It's also interesting to note that if you are walking your dog you are obliged, by law, to be careful with it and to watch it closely when crossing the street. Also by law, as a pedestrian you have every right to move from one side of a street to another, albeit as last in the traffic hierarchy, but you must never ever "cling to a moving vehicle" or deliberately walk in front of one. As if you would ever want to...

## 2. You can stop in the middle of the road

According to Article 18 of Vietnam's Law on Road Traffic, you can be stationary in a road for the time needed to unload or load your vehicle, or "do other things". Lovely and vague, this law tends to be interpreted as "stop whenever you like, with little warning, and move on whenever you fancy".

Officially, drivers are obliged to signal when stopping and to stop in an appropriate place. You cannot leave your vehicle unless you're sure you're not being

dangerous or inconvenient, and you can't open the door of your vehicle unless you are sure you won't hit someone. You can't park or stand your vehicle on a road bend, the crest of a slope, where there is no space, under a bridge, on pedestrian crossings or inside intersections... but in reality? The only real rule is to accept the consequences of whatever you choose to do.



## 3. No riding tandem

You can't hang onto another vehicle. Actually I see this quite a lot - someone has run out of petrol and a friendly uncle comes along, sticks his foot on their exhaust and propels them to the nearest petrol station. Nice, right? Well yes but also illegal.

It is also illegal to ride your motorbike right next to your friend and shout to each other as you drive abreast, to ride in those bits of the road that are not for your vehicle (ahem taxi drivers who drive in the motorbike lanes), using an umbrella whilst driving, driving with no hands or standing on your vehicle whilst it moves. I guess this last one is not exclusive to motorbikes - I wouldn't advise clinging to a car or standing on top of your truck either.







#### 4. You can't carry your entire extended family

We've all seen those impossible piles of people riding the roads on a flimsy two-wheel disaster, and as you would expect this is illegal. According to Article 30 of Vietnam's Law on Road Traffic, only one passenger is allowed behind the driver of a motorbike, unless a second is required because they are sick, have just done something very wrong and are being escorted to the police or are under 14 years old.

#### 5. Honk Before Overtaking

Though the roads here look like chaos, there is in fact a lot of organisation involved according to Article 12 of the Law on Road Traffic. In small, densely populated areas the expected speed is 20-30km/hr, while the limit for other roads is 40km/hr and on the highway you can let loose to a daunting 60km/hr. In reality, I am yet to see anyone driving at any kind of limit and have begun to very much enjoy the concept of driving as fast as you can in the given space. The speed limit seems

unofficially set by the number and nature of the vehicles in front of you.

Road etiquette is also officially set here, and in this case is followed by most drivers with pleasure: overtaking is only to be done after the honk of a horn and a light signal. You cannot, although evidence suggests the opposite, randomly change direction and expect the entire road to react in time. You cannot make a U-turn unless a sign permits it, you can't drive the wrong way on a road and you must signal and be very obvious if you want to reverse.

#### 6. Traffic Fines

If you do something wrong on Vietnam's roads, then you may find yourself landed with a nasty fine. The list below is set by the government - although many of the fines we've seen administered are not so official.

*Source: City Pass Guide*

Offence	Fine	Temporary Motor Confiscation	License Confiscation
Speeding	VND 100,000 - 3,000,000	0	Up to 30 days
Driving on the wrong side of the road	VND 200,000 - 400,000	0	Up to 30 days
Not stopping for traffic lights	VND 200,000 - 400,000	0	Up to 30 days
Changing direction without signalling first	VND 200,000 - 400,000	0	0
Drink driving	VND 2,000,000 - 3,000,000	7 Days	30 Days
Not owning a driver's license	VND 800,000 - 1,200,000	7 Days	0
Using a phone while driving	VND 60,000 - 80,000	0	0
Pushing or pulling other vehicles	VND 200,000 - 400,000	0	0





## Transforming a motorcycle city: the long wait for Hanoi's metro

Vietnam's first metro system continues to be delayed, but in a city with more motorbikes than households – and whose love affair with the car is only increasing – the real obstacle may be shifting public attitudes.

Hunkering down under a sliver of shade along Cau Giay Street, west of Hanoi's city centre, Ha Van Son reclines on the seat of his motorbike taxi. The tree overhead offers little respite from the blistering sun, but he needs to earn a living, so he lowers his kickstand to the pavement and waits. Across the street, some new competition is being built. T-shaped beams tower above the narrow, clogged road: the beginnings of Vietnam's first metro system.

The thirty-something driver isn't worried about job security, though. Like so many of his compatriots, he has accustomed to flitting from one job to the next, according to the whims of the nation's rapidly growing economy. "If Vietnam wants to develop, we should get the metro," he says. "It will reduce vehicles on the roads and make our society more modern."

Hanoi, a city with more motorbikes than households, has to contend with heavy congestion and frequent traffic accidents. In recent years, studies have named it among the worst cities in Asia for air pollution. In May this year, Vietnamese media reported that the US embassy's air quality monitor in Hanoi registered a "hazardous" spike in particulate matter, reportedly reaching a level seven times that recommended by the World Health Organisation.

Though the government hopes the metro can tackle both traffic and environmental issues at once, the project has faced numerous delays and setbacks. What's more, convincing Hanoians to give up their motorbikes could turn out to be the biggest challenge yet.

In 2008, more than 80% of journeys in the city were carried out by motorbikes and scooters – and a fast-growing share of the population is opting for cars. Currently there are roughly 4.9 million motorbikes and scooters on Hanoi's roads. The use of bicycles, once the dominant transport mode in the city, decreased dramatically as motorbikes and cars became more popular: in 1995, 47% of journeys were made by bicycle; in 2008, the figure had dropped to only 3%.



Hanoi's Transport Plan aims to increase the share of public transport from the current low figure of 9% of trips, to above 60% by 2030, by which time Hanoi is slated to have six new metro lines and three Bus Rapid Transit (BRT) lines. But the ambitions get even steeper. Last month, Hanoi's Party Committee outlined plans to ban motorbikes from the downtown area by 2025, in line with improved public transport. A total downtown ban of the vehicles would require a huge lifestyle shift for most residents – and put an enormous amount of pressure on the new metro system. None of the locals I speak to regard the 2025 plan as feasible.

Ho Chi Minh City is planning a metro project of its own, with two of the eight planned lines currently under





construction and the first due to open in 2020. Both the Ho Chi Minh City and Hanoi projects have been described as Vietnam's first metro systems, but which network will open first remains to be seen. In Hanoi, a 12.5km line connecting the Nhon area to the downtown railway station was supposed to be operational by December 2016, but the expected completion date has been pushed back to 2020.

According to the Asian Development Bank (ADB), a funding source of the project, about 15% of construction had been completed by the end of 2015. The line, which will be partially underground, will have 12 stations and is expected to accommodate 754,000 passengers a day by 2030.

Hanoi-based urban planner Floriane Ortega, who worked on the planning of metro lines one and two, says the project has faced delays for several reasons. For one, there are resettlement and compensation issues involved in the construction project, and Vietnam lacks an overarching transport authority to streamline efforts. Hanoi Metropolitan Railway Management Board, the governmental body that oversees the metro project, did not respond to requests for comment.

A line being constructed by Chinese contractor China Railway has encountered deadline delays, funding shortages and safety problems from falling construction debris. Ortega explains that overall coordination between the contractors on different lines – French, South Korean, Japanese and Chinese firms – is lacking. There are issues with contractors wanting to use different ticketing systems, as well as a lack of consensus on how to best integrate stations, which could force pedestrians to exit one station and enter another if the problem is left unresolved, she says.

If these obstacles are overcome "the metro will dramatically change the notion of public space in this country," Ortega says, explaining that public spaces and pavements are currently used more for motorbike parking than for pedestrians. But once the metro opens, commuters who walk from stations to their destinations could force the pavements to be used for their intended purpose once again.

But there's one more caveat to a thriving public transport system: Vietnam must first conquer its car problem.

The country has agreed to eliminate all import duties by 2018 on cars originating from the 10 nations within the Asean Economic Community, of which it is a member. In addition, a reduced luxury tax on cars, which went into effect on 1 July this year, slashed the price tag for vehicles with engines of less than 1.5 litres. "The Vietnamese have a huge demand for cars, especially family cars," says salesman Nguyen Xuan Gioi, who works in a Toyota dealership near the Cau Giay metro line. "In 10 years, I think Hanoi will be like Bangkok. There will be more cars and fewer motorbikes."

Hanoi's urban layout begs to differ. Many streets, especially around the expansive West Lake, can only accommodate one vehicle at a time, forcing drivers on





to pavements. In one neighbourhood, paths have been torn out and the roads widened to meet anticipated demand from car drivers once a nearby housing development is constructed.

Jason Rush, communication specialist for ADB's south-east Asia branch, says the car craze is problematic for a city trying to sell the virtues of public transportation. "Hanoi over the past 10 years has gone through somewhat of a car renaissance," he says. "A lot of people are purchasing automobiles for the first time who were never able to afford them in the past."

Currently, less than 10% of Hanoians use public transportation. The public bus is cheap, but petrol to fill up a motorbike is even cheaper. Some residents are questioning whether an unspoken motivation for the metro project and the planned motorbike ban is to clear bikes off the streets to make room for more cars.

Steve Jackson, head of communications for an international NGO who has lived in Hanoi since 2004, says the transition to cars has made him nostalgic for the waning days of the motorbike. At least traffic moved before cars came around, he muses. "It's great if comfortable affordable public transport can be provided for the less well off – but not if it means the aim is to leave the roads for the wealthy and their cars," he says.

It's hard to envision a Vietnamese city without motorbikes. It's not uncommon for locals to drive to the bakery at the end of their alley or to "walk" their dogs while steering their bikes with one hand, canines trotting alongside.

Part of that attachment is driven by notions of economic progress. "It represents freedom, it represents status sometimes, and it's hard to convince

people to make the switch from that to public transport," Rush says.

ADB's marketing efforts will focus on changing public sentiment about mass transportation. They are taking a page from the metro systems in Seoul, Los Angeles and Bangkok, all of which marketed the metro as trendy and increased the number of discretionary riders.

At the end of the day, Rush says, whether or not people use the metro depends on several factors: accessibility, affordability, aesthetics and amenities. The system should have accommodating parking lots, Wi-Fi and inviting and accessible spaces surrounding metro stations, he says.

Another approach is to market the metro as a lifestyle choice. One idea being tossed around is to issue multipurpose metro cards, allowing electronic payments to be made at businesses around the city, similar to Hong Kong's octopus card.

This change won't happen overnight, and ADB will conduct studies over the next 12 to 18 months to determine which demographics are most likely to use the metro and for what reasons. Convincing residents to take the metro will likely get easier in time, once the system is more far-reaching.

"It's easier to do when you have a big vibrant train system that penetrates every neighbourhood," Rush says. "Obviously in Hanoi there's only going to be a few lines initially, so you have to have a medium-term trajectory for this."

For now, Hanoians will just have to keep donning their traffic fatigues – face masks and Hello Kitty helmets – and battling it out for their spot on the streets.

*Source: Guardian*





# Why self-driving cars aren't safe yet: rain, roadworks and other obstacles

The recent fatal crash involving a Tesla Model S offers a startling reminder that driverless technology is still a work in progress.

As Tesla's own blogpost on the "tragic loss" points out, the autopilot technology that was controlling Joshua Brown's car when it ploughed into a truck is in a "public beta phase". That means the software has been released into the wild to be stress-tested by members of the public so that bugs can be flushed out. It's the kind of approach we are used to seeing when we gain early access to new email applications or virtual reality headsets. As Apple co-founder Steve Wozniak told the New York Times: "Beta products shouldn't have such life-and-death consequences".

Until the investigation into the tragic incident concludes, we won't know whether it was caused by a software glitch or human error – particularly with reports suggesting the driver may have been watching a Harry Potter DVD. All we know is that "neither autopilot nor the driver" noticed the white side of the tractor trailer against the brightly lit sky "so the brake was not applied".

Tesla's autopilot uses both cameras and radar to detect and avoid obstacles, so in this case we know there must have been a double failure. The cameras struggled with the glare from the sun, while the radar – according to Musk – "tunes out what looks like an overhead road sign to avoid false braking events".

Elon Musk may have taken to aggressively dismissing coverage of the crash on his Twitter account, but there are still significant everyday flaws that present obstacles to wider adoption of self-driving car technology.

## Sensor fusion

When you have multiple sensors giving conflicting information, which one do you defer to? This seemed to be an issue at play in the fatal Tesla crash, where the one sensor that did spot the truck misinterpreted it as a road sign overhead.

"The big question for driverless car makers is: how does the intelligence of the machine know that the radar sensor is the one to believe? That's the secret sauce," says Sridhar Lakshmanan, a self-driving car specialist and engineering professor at the University of Michigan-Dearborn.

## Roadworks

When Delphi sent an autonomous car 3,400 miles across the US in April 2015, engineers had to take control of the car only for a 50-mile stretch. The reason? Unpredictable urban conditions with unmarked lanes and heavy roadworks. In other words, an average city commute.

## Sandbags (and assumptions)

One of Google's self-driving cars collided with a public bus in Mountain View in February as it tried to navigate some sandbags on the street. In attempting to move around the sandbags, the car's left front struck the side of the bus that was trying to overtake. The car had

detected the bus but predicted it would yield, and the test driver behind the wheel also made that assumption. "Unfortunately, all these assumptions led us to the same spot in the lane at the same time. This type of misunderstanding happens between human drivers on the road every day," said Google of the incident.

## Weather

Adverse weather conditions create visibility problems for both people and the sensors that power driverless technology. Rain can reduce the range and accuracy of laser-based Lidar sensors, obscure the vision of on-board cameras and create confusing reflections and glare. In a bid to improve the performance of driverless technology in soggy conditions, Google has started testing its cars on public roads near Seattle, where regular rain is guaranteed.

## Hacking

As cars become more hi-tech they become more vulnerable to hacking. With driverless vehicles, the extra computers, internet connectivity and sensors increase the possible vulnerabilities. In a proof-of-concept attack, security researcher Jonathan Petit showed that lidar can be easily fooled into detecting a non-existent obstacle using a handheld laser pointer, which can force the car to slow down, stop or swerve.

## Humans

Just as humans are at fault in more than 90% of car accidents, so too can they be the weakest link in semi-autonomous vehicles – particularly when a functionality labelled as "autopilot" encourages users to place their trust in the machine. "Maybe these intermediate levels [of automation] are not a viable consumer product," says Richard Wallace, the director of the Transportation Systems Analysis group within the Center for Automotive Research. "They go a little too far in encouraging drivers to check out and yet they aren't ready to take control."

## And other humans

It's not just the humans inside cars with self-driving technology, but those in other vehicles that need to be vigilant. Accident rates involving driverless cars are twice as high as for regular cars, according to a study by the University of Michigan's Transportation Research Institute which looked at data from Google, Delphi and Audi.

However the driverless cars weren't at fault – they are typically hit from behind by inattentive or aggressive humans unaccustomed to self-driving motorists being such sticklers for the road rules. Google has started to programme its cars differently to behave in more familiar, human ways, such as inching forward at a four-way stop to indicate they will be moving next.

But it's this collision where the biggest challenges for technology firms lie, encouraging adoption of rapidly developing new technology for a population that is quirky, unpredictable and, in turn, both sceptical and overtrusting.

*Source: Guardian*



# Around about time to improve our roundabouts?



The German word for “roundabout” is “Kreisverkehr”. The German word for “cycle-friendly roundabout” is “Kreisverkehr”. In case you missed it, that’s the same word. Since all urban roundabouts designed according to the German guidelines are automatically cycle-friendly, there’s simply no need for another term.

Now, that’s efficient! And, what’s more, the entire guidance for designing roundabouts in Germany is contained within 40 pages. Compare that with Austroads GRD 4B, which is twice as long and was identified in the NZ Transport Agency’s Cycling network guidance project as having significant gaps in terms of consideration for cycling (i.e. not so efficient).

In New Zealand, roundabouts in general have been shown to be safer for motorists than intersections with other forms of control, but (at least on average) significantly less safe for people riding bikes or walking. Comparing injury crashes experienced by cyclists by intersection control gives some insight as to why. We know that the prevalence of cycling in Germany is very different to that in New Zealand, but let’s take the number of injury crashes signalled intersections to be the base case for each country.

In Germany, the number of injury crashes at roundabouts involving cyclists is 2.1 times that at traffic signals. The New Zealand equivalent is 4.9 times as many cycle crashes at roundabouts compared with

traffic signals. There must be something going on for such a difference to occur. Either we build our signalised intersections much safer than the Germans do, or German roundabout design is fundamentally safer than what we seem to be able to achieve; unfortunately, it’s probably the latter.

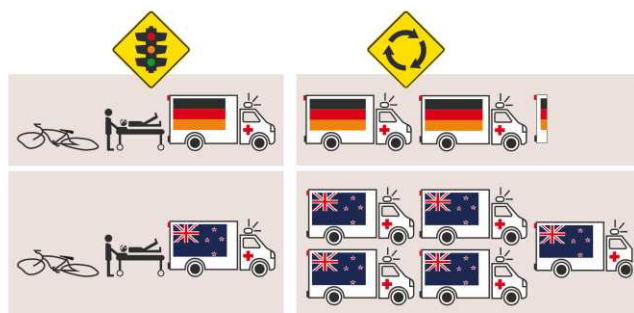


Figure 1: Cycling-related crashes at roundabouts normalised by rates at traffic signal crash rates – Germany vs New Zealand

There is some bad news about the German roundabout guidelines, however – it’s all written in German! The good news is that a lot of the principles have been translated into the Queen’s English (admittedly this was done by a German guy, who reckons he has better English grammar than most kiwis) and incorporated into



the section on cycle-friendly roundabouts of the Cycling network guidance (CNG) online framework.

The even better news is that a CAD file for a roundabout designed according to these principles has been made freely available by ViaStrada, for anyone wishing to use this as a starting point for a specific roundabout design.

So, what are they doing differently in Germany to make their roundabouts so much safer for people cycling? Firstly, given that speed kills (and death is not efficient) they design to reduce the speed differentials between users, especially in terms of approach / entry speed.

A key aspect of this is using radial approaches which make the approach seem more like that of a T intersection; drivers approach slowly, expecting to encounter a sharp turn and maybe having to give way. In theory, many NZ designers recognise the importance of reducing entry speeds (and, admittedly, Austroads does emphasise this for larger roundabouts in higher speed zones); in practice, the achievable operating speeds are still high and therefore have safety risks for all road users, especially those travelling by active modes.

Secondly, the German guidance recognises that it is desirable to have single general traffic lanes for the entry, circulation and exit. This reduces the confusion for people cycling as to where best to cycle, reduces the likelihood of a motorist overlooking someone on a bike, and minimises the number of potential points of conflict between cyclists and motor vehicles.

It is not permitted to design new roundabouts with dual exit lanes, as the rate of crashes involving people on bikes or walking is considered to be too high (this applies even where an off-road circulatory path is

provided because dual lanes increase the risk of crossing the road). The guidelines specify where it is acceptable to have two circulating lanes, but when this is the case, cycling cannot be accommodated within the roundabout and a circular pathway should be provided instead.

By now anyone with any actual experience in designing roundabouts in Australasia is probably thinking something along the lines of: "what a delightful notion it is to welcome two-wheeled pedalling folk into the realm of roundabouts, but how in the dickens shall we continue to include trucks with such fanciful designs?" Well, trucks do exist in Germany too. Big ones, even. And somehow, they seem to manage to get through.

This is partly due to the central mountable apron being easily accessible to trucks but rarely crossed by those driving smaller vehicles (there's a rule about it, and Germans follow the rules).

A lot of thinking has been done about how to make urban roundabouts safer, particularly for cycling. (We haven't presented it all here, more background can be found on the 'Cycle-friendly roundabouts' page of the CNG and ViaStrada's website). What's left to do now? Let's make this experience a turning point and build some kiwi-style-kreisverkehrs... we could consider investing the savings we'll make from reducing crashes into our hockey teams to teach Germany something at the 2020 Tokyo Olympics.

*P.S. if you're still hankering to set your teeth into some multi-lane roundabout design, don't worry, we've got thoughts on those too – stay tuned for another round, including an assessment of crash rates for recently constructed roundabouts.*

**Megan Fowler & Axel Wilke**

Figure 2: The high operating speeds here make this Christchurch's number 1 cycling hotspot



- 1 Bondzio, L., et al. (2012). *Verkehrssicherheit innerörtlicher Kreisverkehre [safety of urban roundabouts]*. Berlin.
- 2 Wilke, A., et al. (2014). *Assessment of the Effectiveness of On-road Bicycle Lanes at Roundabouts in Australia and New Zealand*. Sydney, Australia.
- 3 Cycle-friendly roundabouts (CNG): <http://bit.ly/2c3iSjN>
- 4 German roundabout design (ViaStrada): <http://viastrada.nz/safe-rdbt>



Photo 1



Photo 2



## Best practice from the Pacific Northwest

A trip in February this year afforded Auckland Transport's **Chris Smith** and **Chris Beasley** the opportunity to look at a range of best practice transport design in a number of Pacific Northwest cities in Canada and the USA. The findings will help inform the ongoing development of Auckland Transport's technical standards.

We visited Vancouver, British Columbia; Portland, Oregon; Seattle, Washington; and San Francisco, California. Many approaches to design impressed us in all the cities, for example, the new cycle connection from Burrard Bridge to Point Grey in Vancouver; the new Tillikum Bridge in Portland that caters for buses, light rail, street cars, cyclists and pedestrians only; and the multi-modal vibrancy of San Francisco.

Of all the cities though, Seattle really stood out, particularly due to the similarities with, and relevance to, Auckland, but also due to the great team we spent time with at the Seattle Department of Transport (SDOT). This article will focus on some of the key observations and learnings from our time in Seattle.

Seattle is an inland coastal city, located on the southern arm of the 160km long Puget Sound- the distance from the city centre to the open ocean is approximately 240km. It is the eighth largest port in North America and has a wider metropolitan population of 3.7m, whilst the City of Seattle has a population of 662,000.

As the home to large corporates such as Amazon, Starbucks, and Boeing, as well as the Bill and Melinda Gates Foundation, the city is booming and growing rapidly with significant development underway and planned.

Similarities to Auckland are many:

- The City of Seattle is located on an isthmus, with Puget Sound on one side and Lake Washington on the other
- House prices are sky rocketing with rapid population growth of approximately 12.5% between 2010 and 2015
- It has a maritime climate similar to Auckland- a little cooler and much cloudier. It has 20% less rain but more rain days- often with a light drizzle falling continuously
- It is reasonably hilly with a series of ridgelines cutting west to east across the city
- The transport environment is similar- lots of cars but showing a shift towards cycling, a better walking environment, and a more effective public transport system.

The following 6 areas of transport oriented design outcomes had a particular resonance for us:

Photo 3



### 1. Raingardens

A growing network based system of raingardens is being rolled-out in areas of the city, particularly in areas where urban regeneration is occurring. Whilst the long-term success and economic viability of the asset is unknown, the finished quality is high and the intention is clear.

Photo 1 shows a typical raingarden located on Pontius Street near the Seattle City Centre. This particular facility collects rainwater via a conventional sub-surface pipe network and kerb and channel from surrounding streets and treats it in one location. This creates an efficiency around treatment locations and takes advantage of the available space. Some streets were narrower and couldn't fit a facility so this seemed a common-sense and efficient design option.

### 2. Streetscapes

Developers receive additional development rights if they design, develop and maintain in perpetuity the streetscape environment outside their development sites. The relatively small block sizes (averaging around 120m x 80m) mean that entire blocks are often developed by one developer.

Photo 4



The streetscapes being implemented in association with adjacent property development such as the new Amazon headquarters being developed over 4 city blocks were particularly impressive and included extensive landscaping, off



Photo 5



street bike paths, direct bike access to underground bike park facilities, high quality materials and in some cases publicly owned, privately maintained public spaces.

Interestingly, local officials confirmed that there is no landscaping masterplan in place to provide high level direction and guidance, which means each developer determines plant species, footpath width, and infrastructure provision e.g. bike racks. This has resulted in streetscapes that lack consistency in terms of look and feel, despite the high quality finishes.

Photo 6



Photo 2, shows the streetscape outside the new Amazon headquarters, Photo 3 shows a privately developed public space as a part of the new headquarters, Photo 4 shows another streetscape along Terry Ave North, and Photo 5 shows one building of the new Amazon headquarters complex.

### 3. Cycle Network Improvements

The ongoing rollout of a city centre wide cycle network was comprehensive and in many cases impressive. SDOT have a policy that aims to put every resident within ¼ mile (400m) of a bike facility with a focus on the provision of protected bike lanes. We felt there was a strong correlation to the work being done in Auckland and other parts of New Zealand in this regard. We noted some helpful advice on how to park cars adjacent to the protected bike lanes and the instruction that it was 'never okay' to park in the bike lanes!

Photo 7



The Bicycle Master Plan has guided the development of 129 miles (207 km) of bike lanes and sharrows in the last 4 years with more planned in the years to come. We felt that there was an over-use of sharrows in several of the cities we visited although this may be a reflection of slightly older best-practice, whilst we acknowledge it has a place in the design toolbox.

Photos 6 and 7 show some of the new infrastructure being established in Seattle.

### 4. Bike share system

We didn't get into the detail of this system but the facilities we saw and the map included at each station illustrated that the network of bike share stations was extensive. Of the 4 cities visited, the Seattle system seemed the most comprehensive and well thought out. Photo 8 shows one of the bike stations near Lake Washington. This one also happened to be near a Light Rail Station which provided good interchange opportunity for people shifting between modes. The box to the left of the bike racks contains helmets.

Photo 8



### 5. Alaskan Way Viaduct replacement

The Alaskan Way double deck Viaduct was built along the Seattle waterfront in 1953 and carries 110,000 vehicles per day. Due to a high risk of serious damage in the event of an earthquake, the decision was made to replace it with a 3.2km tunnel with the world's largest tunnel boring machine (TBM) (sorry Alice- big sister Bertha is a 17.4m diameter TBM compared to just over 14m).

Bertha has been plagued by a number of breakdowns and other issues but the tunnel is due to be completed in early 2019 at a cost of approximately \$US4.5b. The viaduct creates a barrier to the waterfront area and once removed, Seattleites will enjoy much better access to their attractive seafront. Photo 9 shows the viaduct running along the waterfront.

### 6. Tactical Urbanism

Tactical Urbanism is a name given to low-cost, low-risk, often temporary measures to trial different approaches to designing parts of the built environment. If successful, they can later be made permanent. One of the more famous locations where this has been successfully tested is in New York led by Janette Sadik-Kahn, the former Commissioner of New York City Department of Transportation.

The team at SDOT has successfully implemented two of these in the last calendar year via their Adaptive Streets Programme. Whilst we were visiting they had been





Photo 9

given a larger budget to roll out an additional 15-20 projects over the coming year and make the first two projects permanent. They worked with other parts of SDOT to identify suitable locations and get stakeholder buy-in.

Photo 10 shows one project at an intersection (University St, E Union Street and Boylston Street in First Hill) where there had previously been safety concerns. Cheap tables and chairs, some flexible bollards, and a fairly vivid paint were used to test out a design.

There is a story behind the paint colour- not their first

choice, but as they say, needs must. Bike through movements were maintained and community feedback was positive. Now the trial has been proven, the team at SDOT were working on designing a permanent solution.



Photo 10

We certainly felt that these 6 areas were key observations of our time in Seattle. There were others of course but these struck a chord with us most. Overall, the trip was very worthwhile with some major takeaways that will hopefully find their way into the development of Auckland Transport's technical standards.

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*Chris.Beasley@at.govt.nz*



*I have no idea how this VW Beetle gets 'around'...*





# The Downsides of Data-Based Transportation Planning

Reliance on data to solve complex problems is subject to what's sometimes called the "drunk under the streetlamp" effect: An obviously intoxicated man is on his hands and knees on the sidewalk, under a streetlamp. A passing cop asks him what he's doing. "Looking for my keys," the man replies. "Well, where did you drop them?" the cop inquires. "About a block away, but the light's better here."

When it comes to transportation planning, we have copious data about some things, and almost nothing about others. Plus, there's an evident systematic bias in favor of current modes of urban transportation and travel patterns. The car-centric data we have about transportation fundamentally warps the field's decision-making. Unless we're careful, over-reliance on big data will only perpetuate that problem—if not make it worse.

To understand why qualitative data can sometimes tell us more, let's look at some documentation about the way one American transportation system performs.

Three recent essays from people walking in Houston make it clear that, there, the infrastructure and land use patterns that facilitate safe walking often just don't exist. The following excerpts are snapshots from a large body of qualitative evidence showing that, in many U.S. cities, walking can be a hellish experience.

Writing in *Texas Monthly*, in an essay entitled "Where the Sidewalks End," Sukhada Tektel describes her experiences adapting to Houston

after living in Mumbai and Toulouse:

*Nothing could have prepared me for the disconnectedness of this oil-and-gas mecca: no clear city center, pitiable public transportation, and, most strikingly, no place to walk... For as far as the eyes can see, there are only cars and not a single person on foot.*

David Yearsely wrote a different essay, albeit with a similar title ("Where the Sidewalk Ends"), describing wandering about Houston's downtown and Third Ward while visiting for an organ music gathering. Even traversing the city's upscale River Oaks district, he describes long, sidewalk-less stretches outside the walled enclaves of the busy four-lane San Felipe Avenue. In ten miles of walking, he encountered only two other pedestrians, both walking their dogs.

At the *Houston Chronicle*, David Dorantes wrote, "I want to walk, but Houston won't let me." Like many migrants to the Bayou City, he has lived in places where walking is a normal part of everyday life. But not in Houston:

*Nowhere else have I ever experienced such fear when walking in the street. I don't mean that I'm afraid of the people who I meet on the sidewalk. I mean that walking in Houston is a horrific adventure, a pleasure endangered.*

It's unfair to pick on Houston. Large parts of most American cities, and especially their suburbs, constitute vast swaths of hostile territory to

people traveling on foot. Either destinations are too spread out, or there just aren't sidewalks or crosswalks to support safely walking from point to point. Moreover, walking is so uncommon that drivers have become conditioned to behave as if pedestrians don't exist, making streets even more foreboding.

From the standpoint of the data-reliant transportation engineer, the problems encountered by Dorantes, Yearsley, and Tektel are invisible—and therefore "nonexistent." Because we lack the conventional metrics to define and measure, for example, the hardships of walking, we don't design and enforce solutions or adopt targeted public policies.

When it comes to car traffic, we have parking standards, traffic counts, speed studies, and "level of service" standards. Traffic engineers can immediately tell us when a road is substandard, or its pavement has deteriorated, or its level of service has become (or might someday become) degraded. By stark contrast, there is no comparable vocabulary or metrics for walking or cycling. We have not collected a parallel array of statistics to tell us that it isn't similarly as safe, convenient, or desirable to walk or bicycle to common destinations.

The American Society of Civil Engineers' Infrastructure Report Card grades roads chiefly on vehicle congestion and delay (using dubious data, in my estimation). And the U.S. DOT's proposed performance measures for urban transportation further codify this bias by making



vehicle delay the chief indicator of how well roads work. The logical result, as Smart Growth America has argued, is that we will end up with a system that optimizes every street for fast-moving cars, with—predictably—negative effects on walking.

The personal stories of pedestrians in Houston are rich and compelling in their detail, but lack the technocratic throw-weight of quantifiable statistics or industry standards to drive different policies and investments in our current planning system.

Last month, the U.S. Department of Transportation announced that Columbus, Ohio, was the winner of its Smart Cities Challenge, beating out six other cities around the country. Google’s city planning subsidiary, Sidewalk Labs, promised to work with the winning city to deploy a wide array of data and communication tools in order to better plan and operate transit systems. While the Guardian speculated that Google is securing a central position for its technologies in urban transportation markets, I have a different concern.

Sidewalk Labs has sketched out Flow, a flashy new data system for transportation. According to its own descriptions and press reports, it will help cities optimize traffic and parking. Clearly, Flow is primarily concerned with vehicles (cars and transit vehicles alike). But there’s little indication how it will address the movement of people on foot and on bicycles. It’s ironic that an entity called Sidewalk Labs appears more concerned with cars than with pedestrians.

As the old adage goes: If you don’t count it, it doesn’t count. That premise becomes vastly more important the more we define problems in big-data terms. New technology promises to provide a firehose of data about cars, car travel, car delay, and roadways—but not nearly as much about people. This is a serious omission, and

should give us pause about the application of “smart” principles to cities and transportation planning.

Consider New York City, perhaps the most pedestrian-oriented place in the nation. New York gathers data on pedestrian activity in a twice-annual survey (which counts pedestrian traffic on two different days in May and September at 100 locations). Contrast that with its system that reports vehicle traffic speeds in real time at more than 300 locations.

This isn’t simply a matter of somehow instrumenting bike riders and pedestrians with GPS and communication devices so they are as tech-enabled as vehicles. An exacting count of existing patterns of activity will only further enshrine a status quo where cars are dominant. For example, perfectly instrumented counts of pedestrians, bicycles, and cars in Houston would show—correctly—little to no bike or pedestrian activity. And no amount of calculation of vehicle flows will reveal whether a city is providing a high quality of life for its residents, much less meeting their desires for the kinds of places in which they really want to live.

The fundamental problem is that we’ve designed our cities for the people moving through them, rather than for the people living, working, and being in them. We’re obsessed with getting there rather than being there.

If we want cities that are truly walkable and bikeable—that can become great places to be rather than easy corridors to travel through—we have to rely on more than just data. We need a framework that considers a wide array of evidence related to what we’ve done and what we’ve left undone; of what we are, and what we aspire to be. Merely grafting more technology on to today’s imbalanced system will not accomplish this.

*Source: CityLab*





# 2016 AITPM Conference report



I was fortunate to attend the Australian Institute of Traffic Planning and Management (AITPM) annual conference, held in Sydney in July 2016, with my trip partly funded by the IPENZ Transportation Group.

We were told at the opening on the first morning that the event was being attended by around 300 delegates, with about 45% from the home state, New South Wales.

There were a total of 17 international delegates, with about half of these from New Zealand, including a cluster from TDG.

The conference is not dissimilar to the IPENZ Transportation Group conference, although it is slightly bigger and slightly more formal (eg there are more sponsors to thank throughout the conference, and less fancy dress outfits at the conference dinner).

The conference on the Wednesday and Thursday had some “plenary sessions”, with all delegates in the one room, interspersed with some sessions with three workstreams running in parallel, namely:

- Traffic planning and management
- Transport planning
- Transport and land use modelling

You are allowed to swap between sessions, to allow you to pick up the most interesting presentations from each workstream. This leads to the inevitable “delegates dilemma”, when you want to be in two places at once.

The conference was celebrating 50 years of the AITPM, so both the opening presentation (by New Zealand’s very own Peter McCombs) and the closing presentation (by Richard Hanslip and Dr Ian Radbone) looked back at the significant changes that have taken place in our industry over the last 50 years and looked forward to the significant challenges and opportunities in the coming 50 years.

Any conference will always be a series of highs and lows. There will be the paper where the abstract seems really interesting, but the author ends up telling you what you already know. On the other hand, there are also those topics where you unexpectedly find a few absolute nuggets that make the trip worthwhile.

Interesting papers included:

- Josh Milston (Arup), “Traffic Generation rates for high density residential developments – understanding the issues”. This provided a rebuttal of the updated RTA/RMS trip rate for city centre apartments
- Doug Weir (TDG): “Does road traffic congestion drive PT usage and how should we respond when major projects shift the balance”

- There were a few more presentations on driverless vehicles, including Peter Davidson (TransPosition) “Driving alone versus riding together – how shared autonomous vehicles can change the way we drive”, and Scott Benjamin (WSP/Parsons Brinckerhoff) “Impacts of Automated Vehicles – Guidance for Australian and New Zealand road authorities”. I say “more”, as last year’s AITPM and this year’s IPENZ Transportation Group conferences were full of them.

- There was a paper on level of service definitions, Lauren Walker (Veitch Lister Consulting) “Beyond Level of Service – towards a relative measurement of congestion in planning transport”. This was a topic I presented on, at the IPENZ Transportation Group conference in 2008 – so it was interesting to be referred to as “Clark (2008)”. This paper sought to refine the current definitions, rather than extend them to F+, to include matters relating to the various functions of the road.

- Sydney light rail: there was a full session on what they are currently doing in the Sydney CBD, closing main streets in order to implement light rail. This sounds exceptionally relevant to the Auckland CBD, with the various projects underway and planned across the city. There were a few learnings for Auckland and alternative approaches that could be considered over here.



- Plus the highlight was a spoof key note speaker, who spoke at the conference dinner. He had been masquerading throughout the conference as a Belgian light rail boffin – and was in fact a very dry comedian.

Most (but not all) presentations and papers are available from the AITPM web site, at <http://www.aitpm.com.au/Conference/Papers/2016-Papers>

I referred above to the number of papers on various aspects relating to autonomous vehicles. This was not meant to be critical, as the number of papers reflects the significant interest in this subject. Indeed I would suggest that it was the main topic of conversation during the tea and lunch breaks, with delegates





swapping views on how soon this technology will arrive, and the various implications and challenges. These challenges appear most acute within the urban areas, where pedestrians and cyclists will clearly continue to rely on human decision making.

The conference was followed by a choice of three workshops/tours, on the Friday, namely:

- Active travel workshop
- Transport modelling workshop
- Multi modal tour.

I attended the modelling workshop, due to my role as chairman of the NZ Transport Modelling User Group (NZMUGS). I have seen it to be part of my role to establish good connections with our fledgling Australian counterparts, now known under the name of the AITPM Transport Modelling Network. I did not present to this year's conference, but I have

contributed in a very small way to the development of their Code of Practice for Transport Modelling, which was presented at the Friday workshop.

In closing there is one topic I need to touch on. Having mentioned that the AITPM conference is not dissimilar to the IPENZ Transportation Group conference, there is one obvious difference: the Australian version embraces transport modelling as worthy of a separate workstream within the main conference, while in New Zealand the modelling fraternity votes each year to do its own thing, and run a separate conference.

At the risk of being accused of "sitting on the fence", it is apparent that there are merits in either approach, with the key issues being greater integration versus greater ability to discuss modelling matters in detail.

*Ian Clark, Flow Transportation Specialists*



## The Aotearoa Bike Challenge is coming!

The Transport Agency is proud to announce that we are working on a new national bike initiative that will run in February 2017.

During February, organisations from across New Zealand can take part in the Challenge, getting their departments and staff to compete to see who can get the most staff to ride a bike. The aim of the Challenge is to encourage more people to discover how easy and enjoyable riding a bike can be, and there will be a number of exciting prizes and spot prizes available as an extra incentive to take part. You can check out the website here: [www.aotearoa.bike](http://www.aotearoa.bike)





# New research study on e-bikes, mobility scooters and other low-powered electric vehicles

On behalf of the New Zealand Transport Agency, ViaStrada is conducting a research project on e-bikes and other low-powered vehicles (mobility scooters, e-scooters, e-skateboards, e-unicycles, self-balancing Segways and hoverboards, etc). The aim is to generate a set of regulatory and non-regulatory options for consideration in New Zealand.

Have your say via this 15-20 minute online survey:  
<https://www.surveymonkey.com/r/lowpowervehicles>



## Types of devices covered by the research

Type	E-bikes		Velomobiles and recumbents	Mobility scooters
	Bicycle Style E-Bike (BSEB)	Scooter Style E-Bike (SSEB)		
Defining features	Two general types: Pedals: pedal assist (EU standard) motor activated by cadence or torque sensor Throttle and Go: throttle controlled (does not require any pedalling).	Throttle controlled Lead-acid battery Pedals are vestigial More like a moped in size, shape, weight	Pedal equipped Pedal assist or Twist and Go throttle activated Most are single seat	Up to 1500 watts (NZ) Seat and handlebars 4 all terrain wheels
Top speed	25 km/h (EU regulated) 32 km/h (N. America regulated) 45 km/h (S-Pedelec)	20 km/h (China) 25 km/h (Europe) 32 km/h (N. America)	25 km/h (EU) 32 km/h (N. America bicycle) 40 km/h (N. America LSV class)	6 km/h (UK Class 2) – footpath (UK) 12 km/h (UK Class 3) – road legal, must be registered (UK) 16 km/h (highest performance sold in NZ)
Image				
Type	Yike Bike	Self-balancing devices	Electric skateboards	Electric push / kick scooters
Defining features	2 or 3 wheels Seat but no pedals	Devices include: • Segway • Powered unicycles • Hoverboards No pedals, generally no seat, may have a handle	Long board length for stability Motor activation can be handheld remote or weight sensors in the board	Available features: • <100wh battery for airline travel (some models) • Folding chassis for public transport convenience
Top speed	23 km/h	20 km/h	20 to 40 km/h	25 km/h
Image				

Figure 1: Various devices covered by the research

## Problem

With improving batteries and economies of scale driving lower prices, electric bicycles (e-bikes) and other low-powered vehicles are becoming more popular worldwide. In New Zealand, import statistics indicate an exponential increase in demand (Figure 1) for the category that includes e-bikes. It is assumed that most of this category would be e-bikes, given the relative scarcity of e-motorcycles in the NZ marketplace.

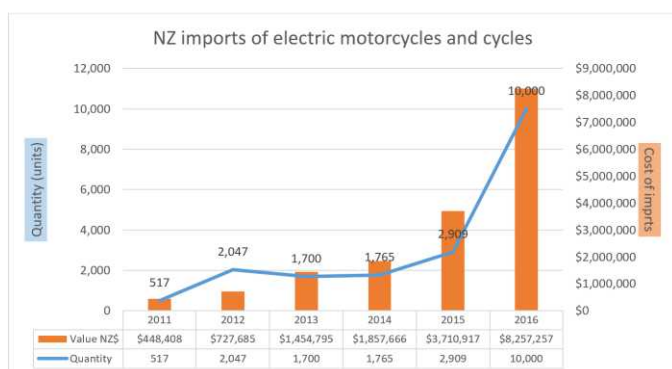


Figure 2: Imports of electric motorcycles and cycles, year ending May 2011 - 2016

Existing retailers, new specialty retailers, and websites are catering for this demand. However, in contrast to most countries, New Zealand legislation only regulates motor power and is silent on other performance criteria such as motor assistance cut-out speed. More powerful batteries and controllers supplying high amperage can enable any otherwise legal motor to propel an e-bike to speeds well in excess of 40 km/h.

Regulators must respond quickly to keep pace with technological and marketplace changes, minimise harm to road and path users, and support the positive benefits (including health) of e-bikes and other low powered vehicles. In addition to regulation, there may be other alternatives to improving safety such as consumer education, skills training, and modifications to infrastructure design guidelines.

## Research purpose

The purpose of this research is to inform any potential changes to the vehicle classification and road user rules for electric bicycles and other low powered vehicles and devices. In addition, the research will determine non-regulatory alternatives for improving safety outcomes. For the purposes of this research, the upper limit for low-powered vehicles has been set at 2000 watts, which includes mobility scooters with a 1500 watt (maximum) motor.

## Research questions

1. What constitutes a low-powered vehicle (existing or future devices) that should be considered in this research? Is low-speed a more appropriate measure, and is there a need to differentiate low speeds depending on where such vehicles are used?
2. How many low powered vehicles should we expect on New Zealand roads in 5, 10 and 20 years' time? And what effect will this have on network planning and development? This will be answered by extrapolating trends in other similar countries and data on NZ sales and imports, and will include high, medium and low demand scenarios to allow for the potential impacts of a range of legislation and policy (from enabling to restricting use and barriers to adoption)
3. Do low powered vehicles, such as scooters, motorised skateboards, powered unicycles and electric bicycles, pose a safety risk to operators or others (compared with non-powered riders and pedestrians)?
4. Do the features of EU standards relating to low powered vehicles make them substantially safer or contribute to improved health more than those typically available in New Zealand? In particular, this is focused on motor cut out speed, throttle operation, and provision of separate categories for various speeds.
5. At what typical age do children develop the cognitive and motor skills necessary to handle low powered vehicles safely within public roadways and paths? Is there a difference between low powered vehicles and devices, and purely human power in relation to age?



To what extent do these skills degrade for older age persons?

6. In addition to EU standards and the assessment of appropriate age (if applicable), are there other regulatory criteria used in similar countries that should be considered to improve safety while supporting mode choice, innovation, and sustainability objectives? How feasible is it to enforce the main regulatory options in New Zealand?

7. Recommendations on the range of regulatory options to achieve the desired outcomes.

Other questions arising from initial investigations:

### E-bikes

Many people in the e-bike industry or e-bike users themselves are concerned about regulation. It has been posited that we don't regulate the top speed of cars, so why should we regulate e-bikes? However, e-bikes are often used on trails, tracks, shared paths, footpaths, and cycle lanes, where the capability of the e-bike matters. The idea is that an e-bike should have similar speed and performance to a normal bike. If it is too powerful and/or fast, then the e-bike is really a moped or motorcycle - with all the requirements that such a classification would entail.

Some of the questions that are arising as the project unfolds include:

- The current 300w output power standard is difficult to measure and enforce. Even if the standard is meant to refer to manufacturer's continuous power rating, major manufacturers such as Bafang make 250 watt motors for Europe and 350 watt motors for North America, but not 300 watts. According to Bafang, over one million Bafang e-bike motors were sold in 2015.

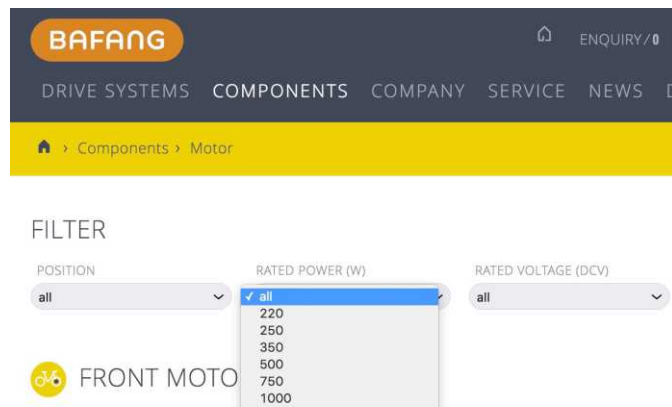


Figure 3: Screenshot of Bafang webpage showing available continuous power ratings (300 watts not available) image source: Bafang.com

- Is the manufacturer's rating of continuous power a good regulatory criterion at all? Power ratings are usually manufacturer certified and subject to measurement method inconsistencies. A European Commission supported document called GoPedelec (2011) suggests no power restriction, enabling sufficient power for even the steepest of hills and heaviest of loads. In a variation of the original 1993 Japanese legislation of 1:1 human to motor power assistance ratio, the recommendation includes tiered levels of power based on the rider power input. This

rule would reflect the situation that applies on a bicycle – the top speed is linked to your muscle power.

- Given how hilly many of our cities are and the advent of child and/or cargo carrying cycles, should we adopt the greater flexibility afforded by the US 750 watt maximum? Or another value, recognising the potential marketplace difficulties that may entail?

- At present, EU standard e-bikes are not common in NZ, largely due to perceived or actual benefits of non-EU standard throttle controls and speed capabilities higher than 25 km/h. If motor cut-out speed is regulated in NZ, should it be aligned with the EU (25 km/h), North America (32 km/h), or some other value (assuming that manufacturers can and will program the controllers with another value)?

- How difficult is it to tamper with e-bikes to increase motor cut-out speeds? Will manufacturers devise ways to prevent tampering?



Figure 4: Installing a dongle renders the control panel readout inaccurate but doubles the speed limitation from 25 km/h to 50 km/h (although most EU standard 250 watt motors are not powerful enough to propel an e-bike beyond 40 km/h) image source: pro-cycling.golla.com

- Throttles are not permitted in Europe, where e-bike motors are only activated by crank motion or pedal torque. The latest pedal assist technologies provide a natural feel and nearly instantaneous response. However, many NZ e-bike retailers are adamant that Kiwis will not stump up the cash for a high quality torque sensor equipped system, and that throttles are better. The research will assess the pros and cons of throttle activated motors versus pedal assist only. More information on the differences between torque sensors, pedal cadence sensors, and throttles can be found here: <https://www.electricbike.com/torque-sensors/>

- In the US and Europe, the "Speed Pedelec" (S-Pedelec) category has been established enabling e-bikes to travel up to 45 km/h. S-Pedelecs have pedal assistance that decreases as speed increases, throttles are not permitted, and additional moped-like requirements usually apply. One of the stickiest issues with a potential S-Pedelec category in NZ will be whether or not to require a motorcycle helmet and insurance, and whether S-Pedelec riders would be



allowed to use motor assistance on shared paths and in cycle lanes (with all the enforceability issues that entails).

### Mobility scooters

The RCA Forum has been grappling with issues relating to mobility scooters for years.

- Should NZ consider different categories of mobility scooters, as in the UK, where models with certain safety features and speed capabilities are permitted to use many types of roads at any time?



Figure 5: A Shoprider Traveso 3 is a UK Class 3 road legal vehicle capable of 16 km/h, also fitted with a hi/lo switch to reduce top speed to 8 km/h for footpath-legal use. Image: thelivingcentre.co.uk

More information: <http://rcaforum.org.nz/working-groups/research-and-guidelines/mobility-scooters>

### Other Low-Powered Vehicles (LPVs)

New types of electric LPVs, especially the self-balancing variety, are coming to market nearly every week. Some of them have potential health, mobility, and first leg/last leg benefits for public transport users.

- Is there a way to create a framework to help objectively assess whether each new device meets a threshold for gazetting as "not a motor vehicle" and therefore permitted to be used?
- Should 20 km/h e-kick scooters be permitted on roads, footpaths, or both? What about e-skateboards?
- Given the publicity around hoverboard and scooter style electric bike batteries catching fire, which international certifications should NZ require compliance with?

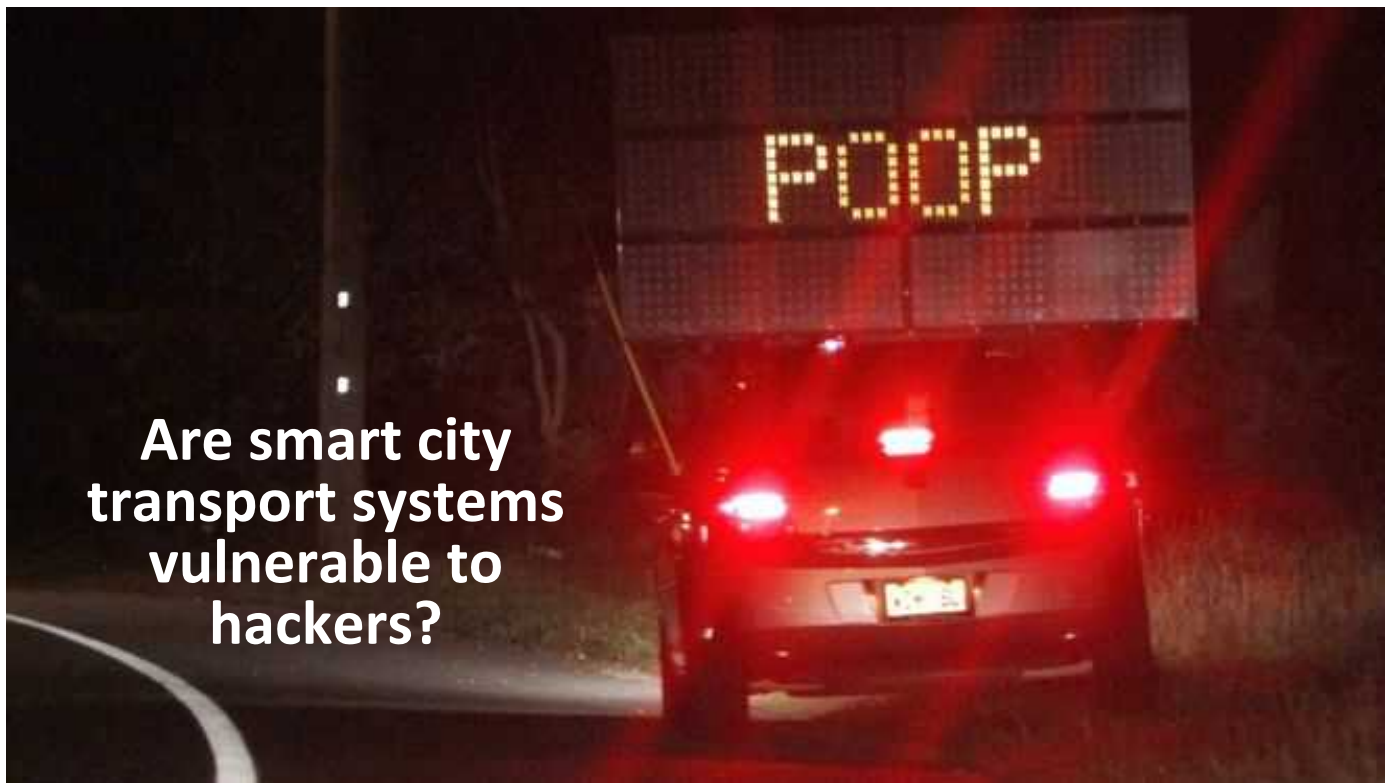
More information: <http://viastrada.nz/ebike-research>

Contact: John Lieswyn – [john@viastrada.nz](mailto:john@viastrada.nz)



During the Second World War, to supply badly-needed beer to advancing Allied troops in France, some Spitfires were modified to carry underwing barrels.





## Are smart city transport systems vulnerable to hackers?

One word. Four letters. "Poop."

It wasn't so much the word, but its position that caused New Jersey photojournalist Lori Nichols to turn her car around on a highway near Atlantic City close to midnight to snap a photo. The word was lit up in bulbs on a freestanding temporary sign - the type that normally says "road work ahead" or "slow down".

The NJ.com reporter wrote a story about it the next day. The sign stayed that way for several hours, she says. "When I had a chance to call the local police department, Hamilton Township in Atlantic County, it was around noon or 1pm, a person I spoke to did chuckle a little bit when I asked about the sign.

"He said that a few people had called in the morning about it, so I would feel comfortable saying the sign remained that way for at least eight hours but probably more like 10 or 12," she says.

Yet, the prankster who seemingly gained easy access to an unlocked panel at the back of the sign could have typed out "mass shooting ahead" or "terrorist threat in area", and produced an entirely different outcome.

And this was just one sign without any connectivity to the cloud. Imagine if hundreds of signs controlled centrally had been compromised. That could have created large-scale chaos.

Cybersecurity experts say we won't have to imagine for much longer. It's only a matter of time before hackers become interested in smart city transportation clouds. Taking control of parking, traffic lights, signage, street lighting, automated bus stops and many other systems could be appealing to bad guys from many walks of life including political activists and terrorists.

Moscow has already experienced its first major transportation hack, albeit to make a serious point

about security. Denis Legezo, a researcher with Kaspersky Lab, was able to manipulate traffic sensors and capture data simply by looking up a hardware user manual that was readily available online from the sensor manufacturer.

A similar story comes from Cesar Cerrudo, the chief technology officer at security company IOActive Labs, who found vulnerabilities in systems used in the US, UK, France, Australia and China.

There's a scene in Die Hard 4 where hackers create chaos by manipulating traffic signals with a few keystrokes. It's not that easy, Mr Cerrudo wrote in a blog in 2014. Even so, he discovered that it would have been possible to create havoc using cheap computer hardware.

Mr Cerrudo says: "I don't think now we are seeing many attacks, maybe some isolated attacks on lower maintained systems. But everything indicates that in the future they will become common because cyber threats are continually evolving.

"As technology gets widely adopted, cybercriminals get more familiar with it and get more resources. Maybe they attack transportation systems and say, 'If you want to keep running the system you have to pay up.'"

Since his "experiment" more than two years ago, there has been a huge investment in expanding smart city transportation technology around the world. America is no exception.

Columbus, in Ohio, was the recent winner of a US\$50m prize offered by the US Department of Transportation. Prepaid cards and apps could allow residents to commute via bus and then arrange car and bicycle-sharing rides if needed.

The groundwork has already started, says Jeff Ortega, a



spokesman for Columbus: "The city recently completed construction of the Traffic Management Center, which is a high-tech area that can manage and monitor traffic signals around the city together with a US\$76m upgrade of traffic signals."

It is hoped emergency vehicles will be able to speed through intersections unhindered in the event of a major incident, and that more specialised bus routes can be offered to help low-income families get easier access to healthcare facilities.

Ultimately, it will mean a complex mix of new hardware and software that is secure enough to please city officials and the public. Columbus has already been offered software from Sidewalk Labs, which shares the same parent company as Google, Alphabet.

But in return for top-notch security, it's possible the "FLOW" transportation planning platform could have conditions attached, for instance an agreement that Sidewalk Labs share ownership of the data generated by the city and the right to process every transaction through its own payment system.



That idea raises many questions about the future control of cloud-based systems. Neither party would comment directly on the issue, pointing out that no contracts have been signed.

In Kansas City, Missouri, the new RideKC Streetcar runs 2.2 miles and is free to use. The Smart City project also includes in-street parking sensors, which allow car owners to find spaces near the streetcar route, and cameras placed on lamp posts that monitor traffic conditions and trigger brightness controls on nearby lights if a pedestrian enters the area.

Kansas City made a conscious decision to make as much data as possible public. However, that doesn't mean everything has to be stored in one location in cyberspace, says Tom Gerend, executive director at Kansas City Streetcar Authority and chairman of the Smart City Advisory Board.

"The cloud is used to store data from the Smart City installation [camera data, streetlights, and so on] but not for streetcar vehicle specific systems. Generally, we have separate services for the individual sub-systems and then aggregate and pool data that we want to make publicly accessible."

But Von Welch, director of Indiana University's Center for Applied Cybersecurity Research, says there will be a bumpy road ahead as transportation hardware manufacturers start incorporating security measures into their products, often for the first time.

"We have a lot of companies making new devices for the [urban] Internet of Things that have not made computers or written software before. They are having to re-learn a lot of the lessons that the rest of the information technology industry learned over the past 20 years," Mr Welch says.

This includes how to respond promptly to security threats and gather information about bugs that the public may report. And IOActive's Cesar Cerrudo says cities and governments around the world have to get their act together as well, particularly when it comes to

the cloud and building systems that are multi-layered and supposedly strong enough to keep all but the most determined intruders out.

He says: "Governments are not enforcing cybersecurity in many ways. Vendors don't have any reason to provide more secure solutions because governments do not test the security. They just have a checklist and believe whatever the vendors say."

Mr Cerrudo warns that there is nothing smart about building a city that has the latest transportation technology, but leaving the infrastructure wide open to anyone who fancies a quick snoop around - or worse.

Source: BBC





# Why Singapore Will Get Self-Driving Cars First



The city-state seems practically destined for autonomous vehicles. The idea of a self-driving car has long held great fascination. In the 1920s and 1930s, “phantom autos” were driven for spectacle in demos across the United States. The cars—often Pontiacs—were not truly “driverless,” as they were operated by remote control rather than computers.

Today, honest-to-goodness self-driving cars are becoming a reality, and not just in the United States. Recently, Delphi Automotive announced that it will launch a fleet of six automated taxis in Singapore next year.

At first, the cars will only travel on designated routes in one district, and a driver will be present to step in if problems arise. But by 2019, the company plans to eliminate drivers as well as steering wheels and pedals, and envisions a fleet of 50 taxis that users can hail via an app and travel in beyond the original area. The first taxis will be Audis, while the expanded group will consist of electric cars.

Though Delphi already has self-driving cars operating in Silicon Valley and is working on more pilot programs in North America and Europe, Singapore makes a particularly good testing ground for automated vehicles. Its manageable size, flat terrain, warm weather, and well-kept roads provide about as simple of an urban landscape as one could ask for. And its government is supportive of such technology, having formed an Autonomous Vehicle Initiative to oversee research in 2014. Recently, the city-state even launched a Center of Excellence for Testing and Research of Autonomous Vehicles, in partnership with a Singaporean university.

Only around 15 percent of Singapore residents own a car, in large part owing to the high taxes and pricey fees that make car ownership in the city-state wildly expensive. The population thus needs—and is clamoring for—more effective and inexpensive public transportation options. A jaunt in a self-driving taxi is projected to cost about a third of a regular cab ride.

Some transportation experts at Singapore universities are questioning whether Delphi will be able to launch its services in such a short time. They cite the need to resolve issues such as a lack of legislation regarding responsibility for collisions and violations, the need for even more advanced technology for the cars to really work, and safety concerns.

Still, eventually the taxis will be shuttling people around, and with any luck they’ll be doing it both safely and for a low price. Perhaps they’ll also help with the Singaporean phenomenon of the seeming complete disappearance of taxis when it rains—an almost daily occurrence in the tropical clime.

*Source: CityLab*

## NZ Modelling User Group Conference 2016 recap



Some have said “The best MUGS Conference yet!”

Was this because of eyebrow raising and highly entertaining candidacy pitches for Chairman? The adventurous walk to the pub in horizontal hail on Thursday evening (just a ‘light zephyr’ according to the Wellingtonians)? Cash prizes? Or just getting away from the office (family?) for a couple of days?

Well, all of the above - along with the relaxed and open atmosphere, the interesting and diverse discussions and presentations, and the embracing of the group to the changing and challenging transport environment.

The 2016 Conference ushered in a new era for MUGS. Ian Clark has done an outstanding job chairing the

group for 9 years since its inception and has chosen to step aside.

The MUGS group acknowledges and thanks Ian for his exceptional contribution to the success, environment, and outcomes of the group.

The mantle and challenge has been picked up by Nathan Harper, who is enthusiastically readying himself for the “where to next for MUGS” mission.

The sessions at the conference ranged from the in-depth and intriguing views of the two guest speakers, Nick Rabbets discussing TRICS and trip data advancements in Australasia and John Williamson discussion economic elements of politically sensitive schemes and how we value our time, to new ways to collect and present data, and a number of views and on the hot-topic-of-the-day; Autonomous Vehicles.

The MUGS journey continues, and we look forward to continued engagement with the IPENZ TG and seeing everyone at next year’s conference.





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## On serendipity and cycle routes

Try googling the meaning of “serendipity” – it means an unexpected discovery, often from a surprise coincidence. I had one of those the other day.

I had just finished reading through NZTA’s “Cycle Network Guidance – Planning and Design”, and also sorting some old papers from my past career. I came across a letter of mine published in 1993 in the UK professional magazine *Local Transport Today*, and was surprised how the points I had raised seemed still topical today.

I was on the Transport Policy Team of Birmingham City Council at the time. I commended a certain other local authority for putting walking and cycling central in their transport policy, saying this was a refreshing change from:

*“ . . . seeing the sum total of alternatives to the car as ‘public transport’ and then being negative about ‘private transport’ as if car transport was all there is to it.*

“Oh yes, ‘encouraging cycling and walking’ is usually in there somewhere, but not in any seriousness as transport modes. Walking is tackled by traffic calming and pedestrianisation as a safety or amenity issue.

Cycling policies usually mean a cycle route network with the assumption that this will mean ‘more cycling’, although the [UK Department of Transport] recent research on the subject suggests much more than cycle routes is needed for this to result.

It’s easy to pay lip service to these, the real green modes, without even beginning to assess their strengths and weaknesses, what contribution they could make to lessening car dependency, or what policies would be needed to achieve this. It contrasts starkly with the exhaustive attention we have devoted to public transport. I suspect the way forward lies in – to coin an overworked phrase – an integration of policies on public transport and non-motorised transport respectively.

The former’s strengths are in the transportation of mass numbers of people over medium to long distances along defined corridors. The latter’s strengths are in the myriad – by far the majority – of short to medium

length journeys, which are likely to take place in a diffused pattern. For these journeys, which often can’t be conveniently or economically-viably served by public transport, the non-motorised modes share the personal availability and flexibility of the car, and in urban areas cycling is often just as quick.

*“To only seriously look at public transport as a car-substitute is to effectively fire on only one cylinder, and to call this ‘integrated’ transport planning is a misnomer. Let’s look seriously at the non-motorised green modes too. They have integrated these two categories on the Continent – just walk out of any Dutch railway station and look at the bike stands. And to readers who say ‘But Holland’s flat’, try Germany and Switzerland as well.”*

I’m talking about integrated planning, not planning for cycling. Integrated planning means planning for the different modes of transport together, not separately. That’s more difficult, not just conceptually, but because you are constantly faced with trade-offs.

We absolutely must trade off, because otherwise we are just bunging things together, hoping for the best, and ignoring the truism that sometimes policy measures for different forms of transport work against each other.

It’s far easier to ‘fudge’ it, and convinces ourselves that we can provide well for cars, well for public transport, and at the same time well for people on foot and on bikes. We can’t, because those different forms of transport constantly interface and interact with each other; so trade-offs are in the very nature of integration. Providing well for one form of transport will come at some form of a cost to other forms of transport, and we dodge this at our peril.

“Integrated transport planning” was the big new thing back in 1993 but, together with its supportive traffic modelling, it had only just started to embrace public transport as meeting some traffic need as an alternative to providing for the car.

It had irked me somewhat that planning for cycling, for all its positive points, was completely isolated from this, the mainstream, cutting-edge new frontier of transport



planning. And I was so pleased to see that one local authority was starting to think broader, that I wanted to commend them.

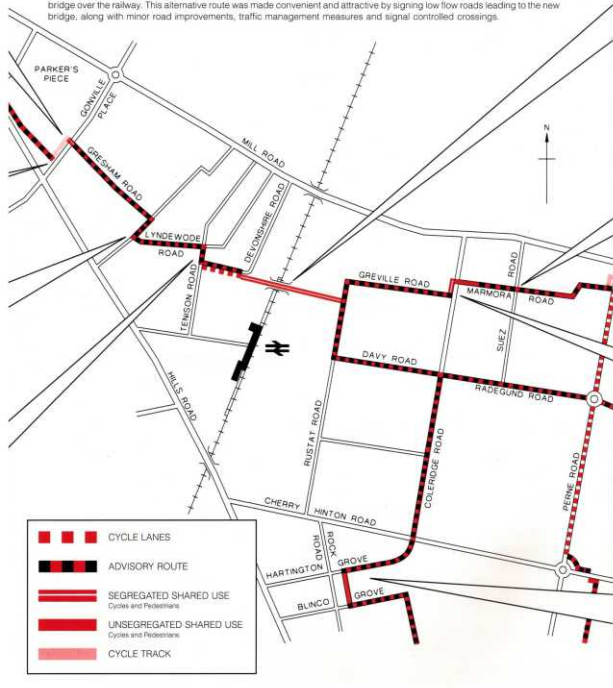
You'll notice I also referred to a UK government trial of cycle networks and routes. This, the late 1980s/ early 1990s Cycle Route Demonstration Project, comprised local trial projects in various towns and cities, based largely on either off-road cycle routes, or what were called 'back street' routes.

### THE SOUTH EAST CAMBRIDGE CYCLE ROUTE

Cambridge is well known for cycling, with 27% of all trips in the city being made by bicycle. Accidents involving cyclists comprise around 45% of all injury accidents in Cambridge. One third of all cycling accidents (about 100 a year) are reported in the south-east sector of the city, mainly on the busy radial routes of Hills Road, Mill Road and Cherry Hinton Road.

The South East Cambridge Cycle Route project was added to the Department of Transport's Cycle Routes Programme of research in January 1987. The aim is to achieve a saving of up to 20% in injury accidents involving cyclists in the area.

The approach adopted was to seek a route for cyclists from the south-eastern outskirts to the city centre, making use of a new bridge over the railway. This alternative route was made convenient and attractive by signing low flow roads leading to the new bridge, along with minor road improvements, traffic management measures and signal controlled crossings.



*South East Cambridge was one of the more ambitious trial routes of the UK's Cycle Routes Demonstration Project, in a town already known for its student cyclists. It attracted existing cyclists from the main roads (avoiding cycle-unfriendly road bridges across the railway) but did not attract significant numbers of new cyclists. This despite including what we would now call a separated/ protected cycleway (Parker's Piece, top left) and a new iconic enclosed pedestrian/ cyclist bridge over the railway (centre of this map, from a 1989 Government leaflet). A photo of this bridge appears in NZTA's recent Cycle Network Guidance – Planning and Design.*

The aims were to increase cycling levels while reducing crashes. These projects were brought together in a comprehensive final report in 1995 ("Cycle Routes") although by 1993 the results of the various individual trials were already well-known. The results were, to put it bluntly, under-whelming.

Nay-sayers said "There, we told you it was a waste of time putting resources into a dying form of transport like cycling".

Many others, including me, said to compare Britain with Denmark and the Netherlands (and other places) where the trade-offs between bikes and cars had been

faced. In Britain, the trade-offs had been fudged: we thought we could provide well for both, and ended up not quite doing a good enough job for cycling, because of an underlying ethic that nothing should be done which disadvantaged mobility by car.

In the Netherlands and Denmark, in contrast, they had adapted the road system so that it was more difficult to get around by car than it was by bike – and new towns, when they were built, had (deliberately!) tortuous detour routes for cars but short, direct and frequently connected ways through by bike and foot.

The results? Legendary (readers probably don't need reminding how high the cycling levels are over there), and downright embarrassing, when seen from mid-1990s Britain.

And NZTA's latest Cycle Network Guidance – Planning and Design?

I'm not concerned about the cycling facility engineering, because that's just a technical job. I'm concerned about the planning, which is different entirely. The aftermath of that 1995 UK Cycle Routes report had been a turning away from a focus on 'cycle route networks' and 'cycling facilities', and a focus instead on general road network planning and traffic management.

No matter how impressive your plans for a cycle route network, they always needs to be traded off against plans for other forms of transport, most notably the car. And that is where, often, the guidance on cycling facilities and route networks, no matter how impressive, fails to make it onto the ground, and cycling still (after decades of this!) fails to break out of the preserve of what Portland's Roger Geller would call the rather limited "enthused and confident" market – that is, people who already cycle.

I don't need to remind readers that cycle route planning has had some pretty disastrous press coverage in certain parts of New Zealand over the past couple of years; this should not just be dismissed as "bikelash".

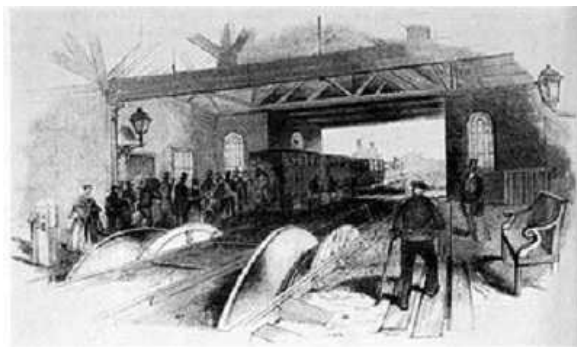
Read the Cycle Network Guidance for yourself, and make up your own mind.

**Roger Boulter**  
Boulter Consulting  
[roger@boulter.co.nz](mailto:roger@boulter.co.nz)





# The First Docklands Railway: The Story of the London and Blackwall Railway



Anyone who has travelled on the Docklands Light Railway to Bank or Tower Gateway will have no doubt enjoyed the view from the train high above ground level. It might be a surprise to many that one of the most modern London railways is travelling on viaducts which are well over 150 years old and are part of the intriguing story of the First Docklands Railway. A newspaper report from 1840 provides some of the details about the innovative London and Blackwell Railway.

## **London and Blackwell Railway 1840**

*A new and important addition to the vast internal resources of this country was made on Saturday by the opening of the London and Blackwall Railway, running between the Minories and the river at Blackwall, presenting to the commercial world an immense saving of time, risk, and expense.*

*The tedious and perilous navigation from Blackwall to London Bridge may now be entirely avoided, which heretofore has occupied more than one-fifth of the whole passage to Gravesend, and the Pool itself may at the same time be relieved from the dangerous presence of the large steamers and other vessels which may henceforth transmit their passengers and cargoes to the heart of the City, by the medium of this railway in the space of ten minutes.*

*Another feature of interest in this railway is the novel nature of its mode of operation. The carriages being propelled by the agency of an enormous rope instead of by steam, a medium which, for a short distance, appears to be effective and perhaps more pleasant and agreeable in the motion than the latter power. The process is this:-*

*The trains are propelled to Blackwall by means of two stationary engines of 120 horse power each which are worked in shafts sunk into the earth to 4 the right and left of the lines. To these engines fly-wheels, or as they are technically termed "drums," are attached, each of which is of the ponderous weight of forty-three tons, and are twenty-two feet in diameter.*

*A "tail" rope is fastened to the drums, which is wound and unwound at each end by the stationary engines, there being also two engines of seventy-horse power each sunk beneath the Blackwall terminus. As the train proceeds to the latter place the drums at the London terminus unwind the rope by which the carriages are to be again drawn to London: and to prevent the rope flying across the sheaves on which it runs too rapidly, and thus becoming entangled, in consequence of no weight being attached to it, an ingeniously contrived break is placed on the platform by the side of the railway, at which a man is employed to regulate the unwinding of the rope.*

*The rope is not an endless one, similar to 'that employed at the Euston Square station of the Birmingham railway, but it is in two parts, namely, one for propelling*

*carriages*

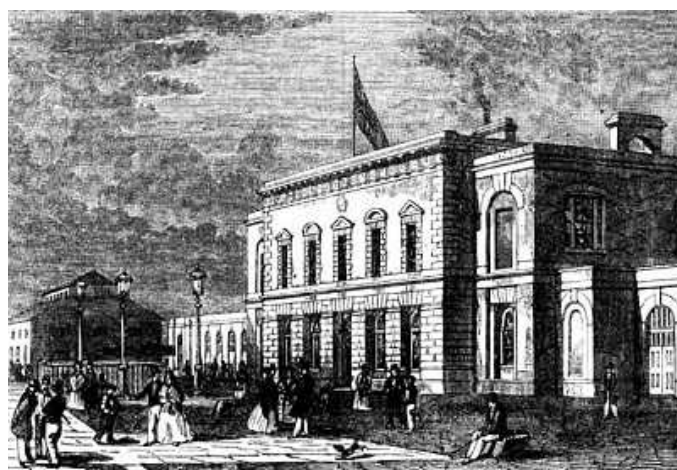
*to Blackwall, and the other from that place. It was manufactured by Sir Joseph Huddart and Co. of Limehouse, and cost upwards of £1,200. The drums take 80 turns to every mile of the ropes, each of which is three miles and half in length.*

*The electric telegraph is the next object of attraction, and it is enclosed in a neat mahogany case, which is so far as it is seen, above the ground and a small bell announces when the train is to be put in motion. The telegraph is the invention of Messrs. Cook and Wheatstone, and enables parties at each end of the railway to 'hold conversation with each other.*

*At each of the intermediate stations one of the telegraphs is placed to enable the servants of the railway to communicate with the engineers of the terminus and it was stated that notice of any impediment or casualty might be given at an intermediate station to one of the termini, and from thence conveyed to the other end of the line in the short space of three seconds.*

*The Blackwall terminus is roofed in a light and elegant manner, and every precaution appears to have been taken to preserve the carriages and protect the travellers from the weather at inclement seasons. At the London terminus the roof is only temporary, as it is intended to complete, as soon as possible, the remainder of the line to Fenchurch-street, where a grand terminus will be erected.*

*Adjoining the Blackwall terminus, capacious offices and store-rooms have been built immediately fronting the river, the Brunswick Wharf and property, belonging to Sir Robert Ingram having been purchased for that purpose. The architectural part of the railway is neat and unostentatious and was designed by William Tite, Esq, the successful candidate for the building of the New*







Royal Exchange. The line proceeds on a series of arches from the Minories to the West India Docks, across the Regent's-canal and the Lea.

The span of the arches crossing the canal and river is from thirty to forty feet, and from the West India Docks the line runs upon an embankment, and the ground falls into a very rapid decline of 1 to 150. So that from the Marsh to the Blackwall terminus the embankment is but a few inches in height. The difference is the level of the line from one end to the other is 18 feet. The three intermediate stations, namely the Stepney, the Limehouse, and the Marsh, are exceedingly neat externally, and conveniently fitted up internally for passengers who have to wait for the trains.

The railway is fenced in with a light and ornamental iron palisade, and the ironwork also presents a more pleasing view to the eye as Mr Jackson, the builder, had the contract for the London end, Mr Webb for the centre, and Messrs Peto and Glissell for the Blackwall terminus of the railway. The length of the railway at present is three miles and a quarter, when it is carried

on to Fenchurch-street it will be three miles and a half. The works hitherto have cost about £150,000. The stationary engines, it was said cost about £30,000.

The carriages are of a deep blue colour picked, out with gold, and the panels bear the City arms surmounted by a steam vessel, the whole encircled with the words, "The London and Blackwall Railway Company" The first class carriages are of the usual description, except that there are no elbows to the seats. They are each divided into three compartments, and are intended to hold thirty-two passengers.

The fare to either of the stations will be 6d. by the first class, and 3d by the second class. The second class carriages are of the same construction as those of the Manchester and Leeds Railroad, and are termed by engineers, " Stand-up," there being no seats to them, and the passengers having to stand during the journey.

The line opened in 1840, and the company changed its name to the London and Blackwall Railway on completion of an extension to Fenchurch Street in 1841. A line from Stepney linking it with the Eastern Counties Railway at Bow was opened in 1849, became known as the London and Blackwall Extension Railway (LBER).

In 1849, it was decided the rope mechanism was too inefficient and the railway converted to steam, other branch lines were added including the Millwall Extension Railway which served the Millwall Docks and later the line was extended to North Greenwich ( Island Gardens).

Towards the end of the 19th century and early 20th century the line took passengers and goods to the various docks and to Blackwall that had for centuries been a major embarkation and imbarkation point in London. However , passenger traffic was closed on the railway in 1926 as a result of competition from trams. The carrying of goods carried on until 1968 before that was closed down and much of the track ripped up.

Remarkably, the first Docklands Railway may have closed but much of its infrastructure was reused as part of the Docklands Light Railway. When the Docklands Light Railway opened in 1987, it used much of the L&BR line between Minories (Tower Gateway) and Westferry.

When you are using the DLR between these points or walking next to the large impressive arches, the viaducts give a few clues to their origins has part of the track of one of London's earliest railways.  
Source: *Isleofdogslife*





# Sydney workers to rip up same stretch of CBD roadway and re-lay it 24 times



Over 20 consecutive weekends a team of construction workers will rip up and repair sections of Sydney's George Street, to make way for future light rail tracks.

They rip up the road on Saturday and rebuild it on Sunday so motorists can use it on Monday. They will repeat this process for almost half a year.

The ripping up of roadway less than a week after it has been laid will seem odd to many Sydneysiders but is needed to ensure east-west traffic flow is maintained in the city on weekdays.

The intersection is one of the busiest in the CBD, and most complex for workers on the light rail. The area is too large to simply lay steel plates for vehicles to drive over on weekdays. Construction crews take it in turns to ensure work is continuous for 56 hours.

Glenn Bentley, the chief executive of the light rail project consortium ALTRAC, said the work on the intersection highlighted the complexity of building the light rail line along the spine of Australia's busiest CBD

"It is one of the most complex intersections we have on the project and it's also one of the longest," he said.

"We always knew it was going to be complex and delicate. This is probably one of the most important phases – clearing the way so we can put down the slabs for the light rail line."

While boasting one of the "most comprehensive mapping of utilities anywhere", the project team is still discovering a large number of unexpected ducts and cables, and other redundant pieces of infrastructure such as rail sleepers under the road.

The tram line along George Street was decommissioned in the 1960s. So far, more than 250 unknown utility services have been found. Gas mains, water pipes, fibre-optic telecommunication cables and high-voltage electrical wires create a spider's web of utilities beneath the light rail route.

The first weekends over the next five months will involve mapping and excavating the area, and removing items such as rail sleepers before major work on underground utilities can begin.

"There is a predetermined time [on the Sundays] when we say this is the time we have to stop and start the

back filling [for the laying of the asphalt and painting of road markings]," Mr Bentley said.

One of the biggest jobs will be work on five major banks of utility ducts, which will be boosted to ensure the area does not have to be dug up when the light rail is operating from 2019.

The area under construction stretches from Circular Quay to Liverpool Street at the southern end of the CBD. Work crews are expected to be working in 19 of the 31 zones along the entire route of the line by the end of the year.

Another complex part of the project – building the line through the inner city suburb of Surry Hills – began in August. It will be challenging because of the narrow nature of Devonshire Street along which trams will run. Traffic can also begin to use a temporary six-lane detour on Anzac Parade to allow for the construction of a tunnel for the tram line.



"As we expected, building light rail down one of the oldest streets in Australia's biggest city has presented some challenges, and will continue to do so throughout construction, but Transport for NSW remains satisfied with ALTRAC's progress given this challenging environment," a Transport for NSW spokesman said.

Transport for NSW and the light rail consortium had investigated the feasibility of laying grass between tram tracks.

However, Mr Bentley said they had decided against laying grass on sections closer to Moore Park, Randwick and Kensington because of the maintenance required and the fact that it could not withstand large volumes of traffic. Laying grass between the tracks in the CBD was not regarded as practical because of the shadows from tall buildings.

Construction of the 12-kilometre line from the CBD to Randwick and Kensington in the city's south-east has been controversial because of the felling of a large number of trees, notably some Morton Bay figs along Anzac Parade.

Transport for NSW said the project's design standards required clearance of tree branches of 2.5 metres and tree trunks of 2m from overhead wires and the area the vehicles will occupy when they run along the line.



# Norway engineers pioneer world's first underwater floating tunnel



Norwegian engineers have proposed a truly innovative solution to a travel difficulty faced by the picturesque country.

As a part of huge infrastructure project in Norway, engineers have proposed to build a world first floating underwater tunnel in a fjord - a long, narrow, deep inlet of the sea between high cliffs.



A major highway that connects the city of Kristiansand in the south to Trondheim in the north cuts through a number of fjords. The highway takes drivers on a 1100km journey but given the unique landscape of the nordic country it involves seven ferry trips to complete the drive.

But the incredible proposal would cut the commute

from 21 hours down to just 11 hours and also mean certain residents wouldn't necessarily need to rely on taking a helicopter to hospital.

Norway's public roads administration is currently preparing a feasibility study for one of the largest fjords on the route - Bjørnafjord. The structure will consist of two curved, 1200m-long concrete tubes hanging 20 to 30m below the surface. The tubes would be connected to floating pontoons on the surface.

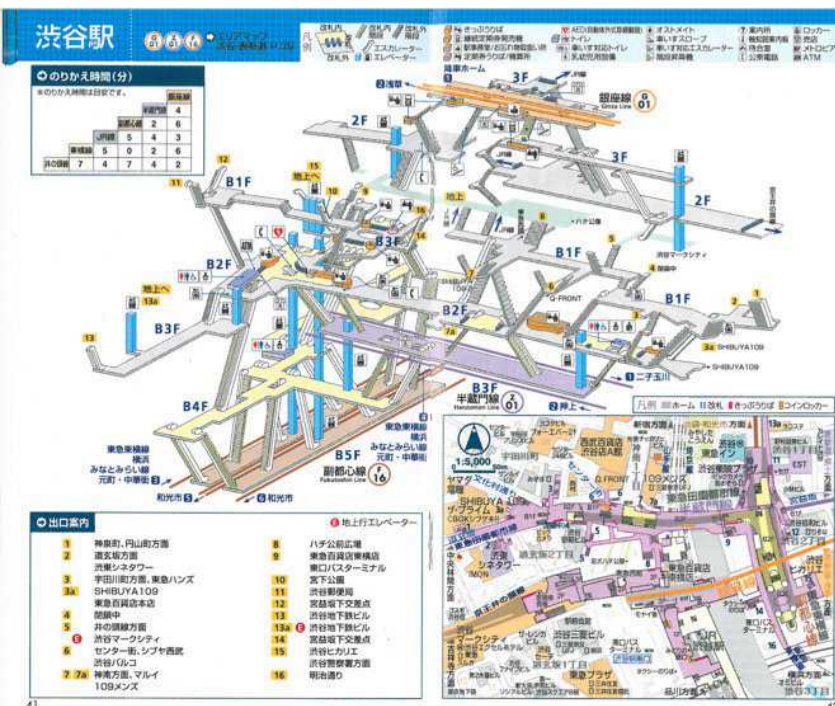


The structure is officially called a submerged floating tube-bridge but is also known as a Archimedes Bridge. The Archimedes principle is named after the Ancient Greek mathematician who came up with the buoyancy calculation, supposedly while sitting in the bathtub.

The principle denotes that the upward buoyant force that is exerted on a body immersed in a fluid, whether fully or partially submerged, is equal to the weight of the fluid that the body displaced.

Senior engineer for the country's public roads administration, Arianna Minoretti, says that working on the project has been hugely exciting.

"For an engineer working on this structure, it's like being on the Discovery Channel every day," she said.



Together with the Toei Subway, Tokyo's is the busiest metropolitan transit network in the world, with over 3 billion annual riders. The Metro's nine lines have 179 stops, where travelers can transfer, in addition to the Toei, to dozens of privately owned rail lines, dozens of Japan Rail commuter trains, and of course, the Shinkansen bullet trains.

The Tokyo Metro has by and large done an excellent job helping locals and tourists alike parse this labyrinthine underground network. Digital screens in every train car display the design of the approaching platform, adjusted to correspond to your current car, so you can see which way you'll have to walk to the elevator, escalator, or transfer points. And then there is the Tokyo Metro Navi booklet, which maps out both the street geography surrounding the busiest stations and the architecture of the stations themselves. This diagram is an example from the booklet.



The Honourable Simon Bridges 12 July 2016  
Minister for Transport  
Parliament Buildings  
Wellington 6011

Dear Mr Bridges

## **ELECTRIC VEHICLE POLICY**

The IPENZ Transportation Group (Transportation Group) is a Technical Interest Group (TIG) of the Institution of Professional Engineers New Zealand (IPENZ). It is the largest TIG of IPENZ with five branches and over 1,000 members.

Please find below a submission, from the Transportation Group, related to the Electric Vehicle Policy announced in May this year.

The policy includes a target of approximately 2% of the light vehicle fleet to be electric by 2021. This is to be supported by a range of measures including extension of existing and introduction of new tax exemptions, the investigation of bulk-purchase opportunities, support for innovation and public charging infrastructure and promotional campaigns. In addition it is proposed to allow electric vehicles to use bus and high-occupancy vehicle lanes.

The Transportation Group supports a number of these measures – in particular the initiative to establish cohesive standards for the required public infrastructure. This will help to reduce the risk that charging infrastructure becomes fragmented between multiple systems and is thus inefficient or expensively duplicated.

However, the Transportation Group is concerned about the proposal to allow electric vehicles to use bus lanes, busways or high-occupancy vehicle infrastructure. The wide majority of the vehicles discussed in the policy are not electric buses, but instead light passenger vehicles. In New Zealand, these carry only approximately 1.3 people per vehicle, something that is not going to change simply due to them being electric. Allowing these vehicles to use bus priority infrastructure and high-occupancy lanes would directly compromise the priority these lanes provide to public transport.

Bus priority is crucial to allow public transport to function efficiently and attractively for users. If buses are held up in general congestion, users generally return to using their cars. This would be a result that is negative for all road users. This is particularly true in New Zealand's most congested urban areas, where bus lanes on key routes such as Dominion Road and the Northern Busway move many more people during the peak hour than the same number of general lanes.

The presence of electric vehicles in bus lanes would also affect people on bicycles who often need to use bus lanes where no proper cycle facilities exists. This would run counter to government's policy of encouraging the urban cycling uptake. Even general traffic is likely to be affected, as electric vehicles will need to overtake buses at stops, creating disruptions to traffic flow in adjacent lanes.

With no clear way to identify electric vehicles to enforcement officers or the general public, the issue of non-permitted vehicles driven in bus lanes is also likely to be exacerbated.

It could be said that with such a small fraction of all vehicles currently being electric, even by 2021, the actual impacts will be very limited. This is likely to be true initially. However, it is clear that further growth of the usage of electric vehicles after 2021 is desired. The impact of 2% electric vehicles on bus lanes may be somewhat marginal. The impact of 5%, or 10% or 20% of all light vehicles being allowed to use bus lanes is clearly not.

In Oslo, Norway, a similar policy resulted in private electric vehicles being 75% of all vehicles using bus lanes, negating most benefits for public transport users.

In this sense, it is particularly worrying that the policy states a 'sunset date' for the tax exemptions. This is proposed to be phased out in 2021 on achieving 2% of the vehicle fleet being electric. However there is no such termination of the bus lane and high-occupancy lane running privileges. Norway has now belatedly introduced such a sunset clause, taking effect either in 2018, or when 50,000 vehicles have been sold in total.

The Transportation Group therefore requests the Ministry of Transport to reconsider this part of their electric vehicle policy, or, at minimum, include a clear sunset clause clarifying that the use of bus lanes by electric vehicles will be a temporary privilege.

We thank you for your consideration of our submission.

**Pravin Dayaram**  
*Chair/Treasurer - IPENZ Transportation Group National Committee*  
DDI 09 921 4193 | M 029 921 4193 | E [pravin@t2engineers.co.nz](mailto:pravin@t2engineers.co.nz)  
*On behalf of the IPENZ Transportation Group*  
cc: Ministry of Transport

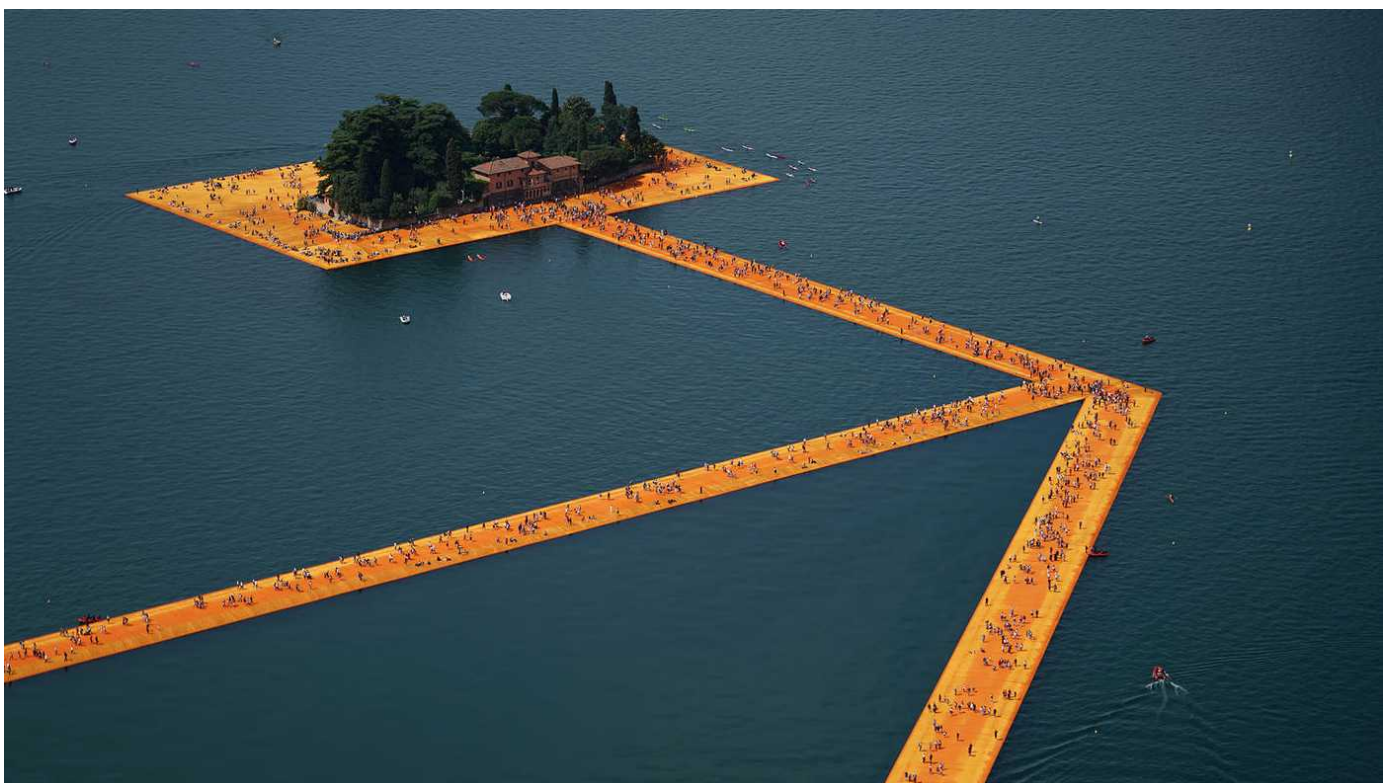


# Floating walkway is a work of art



For sixteen days over June and July, Italy's Lake Iseo was reimagined. 100,000 square metres of shimmering yellow fabric, carried by a modular floating dock system of 220,000 high-density polyethylene cubes, undulated with the movement of the waves as The Floating Piers rose just above the surface of the water.

A 3km long walkway was created by artist Christo as 'The Floating Piers'. The piers were 16m wide and approximately 35cm high with sloping sides. The fabric continued along 2.5km of pedestrian streets in Sulzano and Peschiera Maraglio.







## Superhighway to cycling heaven – or just a hell of a mess?

They are “doing more damage to London,” said the former chancellor Lord Lawson in the House of Lords, “than almost anything since the Blitz.” In the same spirit of absurdist hyperbole, they might be said to be the most transformative public works since Joseph Bazalgette built London’s sewers and river embankments.

They are not, but they do have the potential to change the spirit and character of the capital and of other cities that follow the same path, as well as making its transport cleaner, healthier, safer, more efficient and better able to deal with growing pressure of numbers. They might even prove that the city’s former mayor Boris Johnson was capable of doing something right.

“They” are the cycle superhighways, the most conspicuous of several measures promoted under Johnson. They add up to an unprecedented plan, which is to make the sprawling, awkward, inconsistent city of London bike-friendly. The places most often cited for the exemplariness of their cycling provision – Amsterdam, Copenhagen, more recently Manhattan – were already more ordered, compact and coherent in their layout. In London, the street pattern changes moment by moment, straight to winding, leafy to truck-thronged, wide to narrow.

This in turn reflects the politics of the city, in which power is diffused among its 32 boroughs, plus the City of London, each with its own identity and attitudes. The city’s mayors, for all their ability to attract headlines, have limited means to enforce their will.

The superhighway network therefore has to deal with the fact that the royal borough of Kensington and Chelsea doesn’t want them on its land, meaning there will be a highway-free void in the middle of the capital. In the City, meanwhile, the impatient, assertive people who work for the

financial industry won’t wait long for the red man to turn green, which means they don’t take well to the elaborate multi-phase traffic lights, at which bikes, cars and pedestrians must patiently wait their turn.

Andrew Gilligan, the journalist who became Johnson’s cycling commissioner in 2013, says that “a lot of councils are really cowardly” and that while majorities usually support cycling schemes, local politicians are easily impressed by vocal minorities.

In Kensington and Chelsea, he says, it only needed 15 objections from residents for one proposal to be stopped. It therefore required Johnson’s “leadership” and investment of “significant political capital” to make anything happen. Gilligan himself is not an especially diplomatic figure. “He pissed off large numbers of people,” says one involved in London’s bike politics, “but he made it happen.”

Cycling infrastructure, as commonsensical and humdrum as it might seem, is not just about engineering. It is political, cultural and social. It has to reconcile territorial disputes between people on bikes, people in vehicles and people on foot and between different kinds of cyclist.

It can take on aspects of class conflict, in which drivers sometimes cast themselves, counterintuitively, as underdog victims of a two-wheeled elite. It obliges choices as to what kind of city its citizens and politicians want, with what balance of public benefits and private freedoms and for whom.

Just before he left the mayoralty this spring, Johnson inaugurated a stretch running along Bazalgette’s Victoria Embankment from the City of London to parliament. Cyclists applauded him as he rode along it. Van drivers hurled obscenities.



Running through the centre of the city and the districts of the country's government, past landmarks such as the Tower of London and the Palace of Westminster, it was the most conspicuous of his interventions, symbolic confirmation that new cycle routes were not marginal but as important to the running of the city as railway lines and roads for vehicles.



The route, called the east-west cycle superhighway, is contentious. Taxi drivers hate it. It affects the car-bound journeys of people of power and influence: Lord Sugar moaned during its construction and Sir George Iacobescu, the man in charge of the Canary Wharf development, said it strangled traffic, and lobbied Downing Street against it.

The Royal Parks objected to a proposed extension past Buckingham Palace. Gilligan says that Boris "kept being harassed by MPs, colleagues plucking at his sleeve and complaining that their drive from wherever had got longer by so many minutes".

For the cyclist, the east-west superhighway is the most impressive part of a system that can be ramshackle in parts. It is broad and stately, under the embankment's plane trees, well separated from fuming drivers alongside. It feels safe.

When complete, it will run alongside St James's Park, through Hyde Park and onwards, making it possible to ride 18 miles from Barking in east London to Acton in the west, and be separated from traffic almost the whole time. It was announced last week that it will be joined by a route north from Oxford Circus, through Regent's Park to Swiss Cottage, after the new mayor, Sadiq Khan, approved it.

A superhighway, in theory, is a route that separates cyclists from other road users, although early examples achieved this sketchily, with strips of blue paint that acted more as ignorable suggestions than actual barriers to trucks and cars. It is linked to other measures given catchy names by the journalists Johnson and Gilligan.

There are "mini-Hollands", whereby three outer boroughs get to share £100m on making local improvements. There are also Quietways, which join up the slack and underused byways of the city to make safe and unthreatening routes. The first of these runs six miles from Waterloo station to Greenwich through council estate car parks, little-known parks and along disused railway embankments. Created with the help of the charity Sustrans, it opened in June.

The logic, says Gilligan, is that London is facing ever more demand for transport and that encouraging bicycle use is the best way to meet this demand. Building more roads on the congested and high-priced land is physically and politically unfeasible.

Expanding the underground network is slow and expensive. A cycling commuter takes up much less space than one in a car, which rather obviously means that they use the existing roads more efficiently. Cycling has the added benefit of reducing pollution and benefiting the health of participants, at least of those who don't get injured.

What stops more people riding bikes is danger and the perception of danger, especially among parents with children, women and older people. The risk of death is actually small and declining: figures from Cycling UK show 33 deaths out of 90m London cycle journeys in 1989, falling to nine out of 270m journeys in 2016.

But well-reported tragedies such as the death of 26-year-old Ying Tao outside the Bank of England last year, induce understandable fear. The idea of superhighways and allied measures is both to be safer and to feel safer, so that more cautious cyclists will venture out. Few school runs are made by bike and campaigners want to change this.

In its current state, the incomplete system imperfectly achieves these aims. The Embankment stretch is mostly glorious – "Just before it opened I had trucks snarling down my back," says one user. "Afterwards, I could chat to a colleague as we went along" – but it unravels into confusion at its end.

Elsewhere, the network can be inconsistent and bewildering. Municipal sphinxes have left riddling signs that have to be interpreted at speed: turn-right-give-way-cross-turn-left, turn right in two phases only, go left in order to go right. Inscrutable numbers and symbols refer to a higher concept that is imperfectly explained.

There is a plethora of special conditions, works of intellectual ingenuity that as soon as comprehended change into something else. You have to decipher which half-defaced cycle logo on the pavement and which little blue sign is telling you where to go and how to behave in relation to pedestrians.

They, also confused, may swear at you in the belief that you are encroaching on their space. At some point on an unfamiliar route you are likely to lose the thread and find yourself discharged into the hostile realm of HGVs. It resembles an old-fashioned board game: go back three spaces, throw a double to avoid the Dark Forest or a six to find the Magic Bridge.

Objections are not all from privileged lords. A mini-Holland in Waltham Forest, north-east London, brought out a multi-ethnic, not-posh crowd of hundreds of protesters objecting to its effects on shops and traffic congestion.

A Conservative councillor, supporting the objectors, said that cyclists are "almost entirely middle-class, young white men". Gilligan dismisses this argument – "It's complete rubbish to say the motorcar is the bastion of the poor" – but the row shows that the virtues of cycling are not always self-evident to everyone.

Gilligan, like other pro-cycling campaigners, has a series of arguments to refute the most common objections. Cycling routes are usually good for shops that lay along them, they say. Traffic will adapt to new circumstances. "People think it is like water and if you narrow the pipe it will flood," says Gilligan, "but it is not a force of nature. It is a product of human choices."



If you give less road space to cars and improve conditions for cycling, in other words, more people will give up driving. There will still be congestion, but for other reasons than new cycle lanes – “population growth, the rise of Uber cars, cheaper petrol”.

His basic argument is indeed overwhelming: it can only be good if more people use a city’s roads more efficiently, at less cost to themselves and in public expenditure, while causing less pollution and less danger to themselves and others than is created by driving. More than that, a city that is more pleasant for cycling should, at least in theory, be more pleasant for everyone else.

Sustrans says its new Quietway has helped civilise an area around Millwall Football Club, whose character was previously dominated by brutal fences for segregating fans. At their best, mini-Hollands create quieter, calmer zones for pedestrians. The Victoria Embankment is now a better place for walking thanks to the buffer that the cycle lane creates between pedestrians and cars.

Yet we fall short of Utopia, not least because too many cyclists are themselves imperfect citizens. The Lycra lout, with his unpleasant musk of sanctimony and testosterone, looms over all discussions about cycling. Peter Murray, chairman of New London Architecture and a passionate cyclist, recalls the “die-in” held to commemorate Moira Gemmill, the design director killed in Westminster in April 2015.

The roundabout where she died was briefly closed as cyclists lay on the ground in protest. Taxis, vans and scooters respected the moment. “The only people who spoiled it were the Lycra brigade”, who insisted on picking their way across.

Val Shawcross, deputy mayor for transport under Sadiq Khan, wants to promote walking as much as cycling and says the latter should be “for all ages and genders”. So it is essential that superhighways achieve their ambition of attracting different, gentler users.



In the short term, they are more likely to increase aggression: drivers, for example, now shout at cyclists if they don’t use the highways. There has been a kerfuffle about lunchtime joggers using the cycling surface, although Murray and other regular cyclists are relaxed about this.

The name “superhighway” is unhelpful, as it suggests an unimpeded charge, Froome-like, along the Champs Élysées, and their shade of blue implies a cycling equivalent of motorways. In reality, as cyclists are slowed down by crossings for pedestrians and detours behind bus stops, they require a more careful pace.

There is a strong suspicion that Boris Johnson rushed through his cycling plans in order to claim credit before his mayoralty expired, with the combination of self-aggrandisement and inattention to detail that typified his other grand projects.

There are indeed glitches. Shawcross accuses him of causing unnecessary disruption by starting too many roadworks at once. But, given the blind unreason of Lord Lawson, and the capacity for obstruction offered by the complexities of improving cycling in London, this is an occasion to be grateful for his gung-ho spirit.

*Source: Guardian*









The courses below are available for full-time or part-time students studying for the following postgraduate transportation qualifications at Canterbury:

- Certificate of Proficiency (COP) ~ for individual one-off courses (great for CPD!)
- Postgraduate Certificate in Engineering (PGCertEng) ~ typically four courses
- Master of Engineering Studies (MEngSt) ~ typically eight courses
- Master of Engineering in Transportation (MET) ~ up to six courses plus research project/thesis

Domestic student fee per course in 2016 is \$1018 incl. GST, + Student Services levy (up to \$385/semester).

All courses run in “block mode” to enable **part-time and distance students** to easily take part. In 2016, the contact time will be reduced from **six to five days** (i.e. a 3-day block followed by a 2-day block), and students taking the courses will be expected to do more reading and learning in their own time.

All prospective students must apply to enrol in courses no later than **one week prior** to the course starting (preferably earlier), otherwise late fees may apply.

Candidates with a Bachelor of Engineering OR other relevant degrees (e.g. planning, geography, psychology, maths), OR non-degree qualification and suitable work experience, will be considered for entry.

COURSE	DESCRIPTION <i>(more detailed Flyers available on website)</i>
<b>Semester 1</b>	
<b>ENTR401: Fundamentals of Transport Engineering</b> (Self-study course, with 1-day tutorial for S1 course 27/02/2017 For S2 course 24/07/2017)	Transportation planning; Road link theory & design; Intersection analysis & design; Traffic studies; Accident reduction; Sustainable transport planning & design; Intro to Pavement design. {bridging course for non-transportation students}
<b>ENTR603 Advanced Pavement Design</b> (Block dates 6-8 of March, 8-9 May)	Cover the principles and fundamentals of Superpave characterization system, Multilayer analysis using Circlay, traffic volume and loading calculations, Austroads Mechanistic Empirical pavement Design, Deflection analysis and backcalculations, and Overlay Design.
<b>ENTR615: Transport Network Modelling</b> (Block dates:20-21 of March, 22-23 of May)	Principles of transport modelling; Road network modelling; Meso-scopic simulation (SATURN); Microscopic simulation (Paramics); Intersection modelling (SIDRA); Road network reliability & resilience.

### Semester 2 (Jul-Oct 2016)

<b>ENTR617: Traffic Engineering and Design</b> (Block dates:21-22 Aug, 25-26 Sep)	Traffic flow & queuing theory; traffic study design and analysis; local area traffic management; traffic signals; intersection safety; parking planning and design; traffic detection; intelligent transport systems.
<b>Quantitative Techniques for Transport Engineering and Planning</b> (Block dates:14-15 Aug,18-19 Sep)	Optimisation and linear programming; sensitivity analysis; simulation modelling and analysis; statistical modelling; estimation of statistical models; validity and hypothesis testing; survey design; analysis of surveys experimental design; statistical inference techniques.
<b>ENTR613: Highway Geometric Design</b> Block dates:31/Jul to 1/August, 2-3 Oct)	Human and vehicle factors; sight distance; horizontal and vertical alignment; cross-section design; design plans; land use access; signs, marking, delineation; intersection design; major design project

*Note: Other relevant courses at Canterbury (e.g. Risk Management and Construction Management courses), University of Auckland or elsewhere may also be suitable for credit to a PGCertEng, MEngSt or MET.*

For more details contact:

**Dr Mofreh Saleh** Phone: (03) 364-2987 Email: [mofreh.saleh@canterbury.ac.nz](mailto:mofreh.saleh@canterbury.ac.nz)

Or visit the website: [www.met.canterbury.ac.nz](http://www.met.canterbury.ac.nz)



# ITS NEW ZEALAND SUMMIT

## OCTOBER 5<sup>th</sup> 2016, AOTEA CENTRE.



The Intelligent Transport Systems NZ Annual Summit is a one-day event attended by leading transport decision makers, ITS and transport technology innovators, suppliers, engineers and academics.

**New Zealand's most important transport technology event**, this year the Summit coincides with the ISO TC204 Standards meeting and we are fortunate to have confirmed **world-leading experts** to make presentations and join a panel discussion. In addition we will have senior representatives from the Ministry of Transport, NZTA and CAA updating us on their objectives and strategies.



**Our Future is Here:**  
**Autonomous Vehicles, Cyber**  
**Security, Safety, Efficiency and**  
**Sustainability**

Don't miss this opportunity to network with your colleagues and peers and gain insights from the experts who will be addressing topics including:

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- **Big Data and Smart Cities**
- **ITS in Freight and Public Transport**
- **Sustainability and Electric Vehicles (EVs)**
- **Transport Safety**
- **Cyber Security**
- **Latest Trends, Research and Innovative Transport Technology**

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**Dear Friend,**

The 38th Australasian Transport Research Forum (ATRF 2016) will be held in Melbourne from 16-18 November 2016.

The ATRF is the principal transport research conference in Australia and New Zealand. It brings together transport researchers, policymakers, advisors and practitioners from a range of disciplines to share and build upon the latest research and thinking. Note that the conference will be co-located with the ARRB conference in 2016, allowing ATRF attendees to partake in the activities of both conference.

ATRF 2016 is moving into a new era with the development of a co-ordinating Central Committee, ATRF Scientific Committee and Local Co-ordinating Committee. The ATRF Scientific Committee is being formed to take responsibility for the reviewing of papers, with leading experts assisting with coordination of peer-review for abstracts and papers submitted in the following theme groups:

- T01: Freight & logistics
- T02: Transport modelling, forecasting & simulation
- T03: Transport analysis & big data
- T04: Active Transport (cycling, walking, etc.)
- T05: Public transport
- T06: Transport & land use / urban design
- T07: Planning & policy
- T08: Transport economics
- T09: Aviation / Maritime
- T10: Transport surveys
- T11: Safety
- T12: Environment
- T13: Advanced technology, automation & ITS
- T14: Travel behaviour change & demand management
- T15: Other transport research

ATRF accepts papers on any aspect of transport, including work in progress. The conference is crossdisciplinary and submissions are encouraged from across all fields including economics, psychology, engineering, information technology, planning, geography, policy studies and more. We especially encourage practitioners to submit.

Papers can be research based and/or demonstrate the use of innovative or novel approaches to transport issues, behaviour, policy, planning, technology and systems. ATRF provides excellent outlets for publication with strong peer-review processes. The proceedings of past ATRF conferences provide one of the leading repositories of transport research from Australian and New Zealand (see [www.atrf.info/papers](http://www.atrf.info/papers)).

For details go to: [www.atrf2016.com.au](http://www.atrf2016.com.au)

**Professor William Young Chair,  
Local Organising Committee  
[bill.young@monash.edu](mailto:bill.young@monash.edu)**







# Photo Competition

This edition is all a range of Vietnam photos. Seen anything more unusual? Send photos to: [daniel.newcombe@at.govt.nz](mailto:daniel.newcombe@at.govt.nz)





## Auckland/Northland Branch

### Wrap-Up of Recent Events

#### Cycling Infrastructure and Intersection Designs: Learnings from Study Tour

Claire Graham was one of the winners of this year's IPENZ Transportation group's study awards. Claire works for Auckland Transport as Senior Specialist – Walking & Cycling in the AT design office.

She used the IPENZ TG award to travel to North-America and Europe to gain insights and expand her knowledge around the design and successful integration of cycling into cities. Her main focus was on separated cycle facilities and intersection design. Claire shared her learnings and in-depth observations in this technical group meeting.

#### Trips Database Bureau – Auckland Branch Seminar

Tuesday 6 September 2016 - 5pm

This seminar was part of the 2016 TDB National Seminar Series. This included a presentation by TRICS Managing Director, Nick Rabbets.

#### Upcoming Events

#### Bus and Coach Association New Zealand Annual Conference

Tuesday 27 September to Friday 30 September

The annual conference is being held in Dunedin with more information available here:

<http://www.busandcoach.co.nz/media/conference2016.html>

## IPENZ Transport Careers Evening

Thursday 29th September 2016 – 5pm

University of Auckland General Library (Alfred Street)

Rather than graduate recruitment, this event will focus more on providing general information about potential careers in the transportation industry. This event will be more targeted at students in their earlier years of studies who are interested in transportation. The intention is to create awareness about different pathways and potential employers.

Members are encouraged to come along and meet with students interested in a career in transport. Please RSVP via the event Facebook page for catering purposes.

<https://www.facebook.com/events/1733343503590289/>

## Waikato/Bay of Plenty Branch

Busy organising the conference!

## Central branch

### Car share in Wellington

Date: Monday, 19th September 2016.

Time: 12 pm sandwiches etc. Presentation at 12:30 pm taking 30 minutes, followed by 5-10 minutes for questions. Finishing up at about 1:15 pm.

Venue: Pickering Room, IPENZ office at Level 3, 50 Customhouse Quay, Wellington.

Presenter: Elise Webster – Principal Advisor, Transport Strategy, Wellington City Council. Alex Scott – Head of Operations, Cityhop. Oscar Ellison – Founder and CEO, YouDrive.

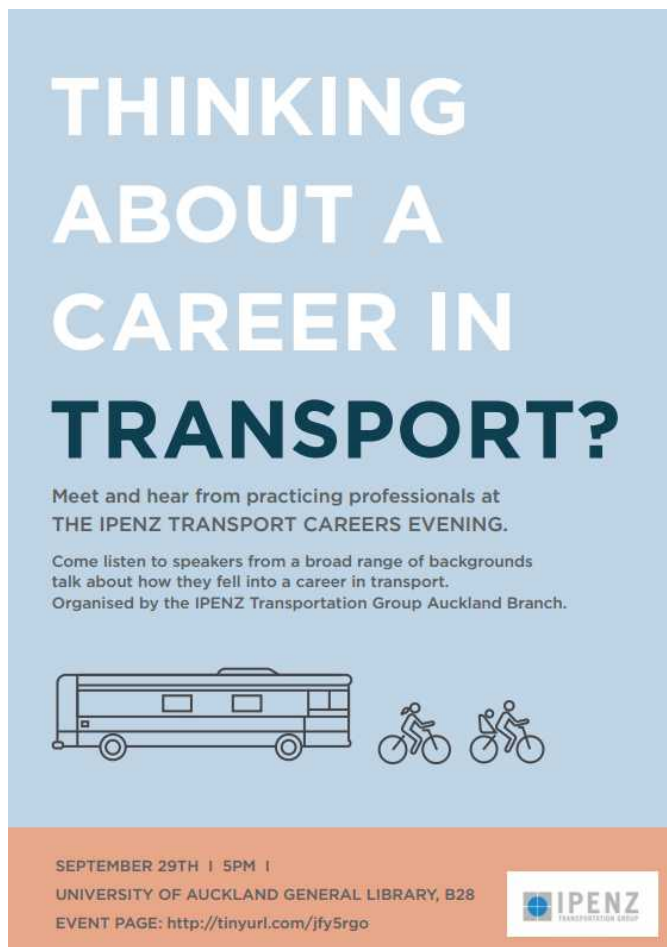
Overview of presentation: How we can enable people to think differently about car ownership and the result that this could have on planning, roads and infrastructure. Presenter Elise Webster will give you a brief introduction on Wellington City Council's car share policy and how WCC is supporting the local car share companies. Business operators from CityHop and YouDrive will explain how car share works and share their views on the future of car share.

#### Bios:

**Oscar Ellison** is the founder and CEO of YourDrive - a peer-to-peer car sharing scheme that was founded 18 months ago. There are now over 100 vehicles being shared through YourDrive. Oscar holds a BE(hons) from Auckland, having previously worked at Downer as the Northern Region Planning Manager. Over the last 4 years he has developed more of a technology focus working on YourDrive and with other early stage technology companies. Oscar is also a founding and core member of the organising team behind TEDxAuckland.

**Alex Scott** is the head of Operations for Cityhop, managing membership and making it as easy as possible for people to be one car less and use car share instead. Cityhop is NZ's first car share company and was founded by Victoria Carter.

**Elise Webster** is a Principal Advisor at Wellington City




**THINKING ABOUT A CAREER IN TRANSPORT?**

Meet and hear from practicing professionals at  
THE IPENZ TRANSPORT CAREERS EVENING.

Come listen to speakers from a broad range of backgrounds  
talk about how they fell into a career in transport.  
Organised by the IPENZ Transportation Group Auckland Branch.

SEPTEMBER 29TH | 5PM |  
UNIVERSITY OF AUCKLAND GENERAL LIBRARY, B28  
EVENT PAGE: <http://tinyurl.com/jfy5rgo>





Council's Transport Strategy team. She led the development of Wellington City's first car share policy.

The NZPI Wellington Branch, together with the Resource Management Law Association and the IPENZ Transportation Group invites you to:

**Wellington Mayoral Candidates Event**  
 Buddle Findlay, 1 Willis St, Wellington  
 27 September 2016 from 5.45pm

The role of Mayor in Wellington is incredibly important in providing strategic direction and leadership and also championing the change and growth of our City. We are asking mayoral candidates to come and present their ideas and policies in this critical area.

We want to hear from them about their dreams for the City and their plans as to how we to achieve them. They will outline what they think planners and lawyers should be doing to help achieve their aims.

There will be short presentations from Helene Ritchie, Nicola Young, Jo Coughlan, Justin Lester and Andy Foster followed by questions from the audience. RSVP required.

For full details and to register your attendance please use the following link:  
[https://www.planning.org.nz/Event?Action=View&Event\\_id=801](https://www.planning.org.nz/Event?Action=View&Event_id=801)

Tickets \$15 and are non-refundable. All proceeds are used to cover the venue hire and catering costs.

The IPENZ Transportation Group invites you to:  
**The Costs and Benefits of Inner City Parking vis-à-vis Network Optimisation**  
 IPENZ Pickering Room, 12:00 in w/c 10 or 17 Oct TBC – awaiting confirmation of venue availability

In this session, Chris Bowie from Opus Research will present the findings of research into the costs and benefits associated with converting inner city kerbside parking to new uses in New Zealand.

This study shows that often the reasons for road space reallocation are non-monetary in nature, and therefore not well evaluated using a traditional economic approach. In addition, there is a lack of local evidence for the effect of such projects and this, in some cases, has created a barrier to change.

Chris will present the evidence for monetary and non-monetary costs and benefits of kerbside parking reallocation collected from a series of engagement workshops with industry professionals across New Zealand.

He identifies the benefits that can be gained from better pre- and post-evaluation of such projects, and how road space reallocation is an important lever for achieving transportation and land use benefits.

**Canterbury-Westcoast Branch**  
 In July we sponsored a Christchurch Conversation event

(4 July), Gil Penasola - The 8 80 City: Creating Vibrant and Healthy Communities. The event (below) was well attended by people from all 'walks' of life.



Also in July we held our annual Quiz night – our Social Event of the year. For the second year in a row we had a great turnout, 11 teams this year!



*1st Place – Team 'Question Time Panic' - Tim Wright, John Falconer, Stuart Woods & Paul Roberts*

Held at the lovely University of Canterbury Staff Club (cheers Alan Nicholson!) a good time was had by all, despite some intense and obscure questions.

There were comments that teams would have benefited from a having an older member, particularly for the music questions - a tip for next year! Thanks to the Stigs brother (aka Mike Smith) for being Quiz Master. See you next year!



*Best team name – 'Quizghanistan' – Shane Boshier, Jeremy France, Alasdair Lothian, Umesh Easwarapadcham (and The Stig)*

**Southern branch**  
 Awaiting report



# Roundabout of the month



This is what the Silverlink junction in North Tyneside could look like after a major project to turn it into a triple-decker roundabout. The \$150m scheme involves lowering the A19 beneath the existing A1058 Coast Road and roundabout, providing a free flowing link.

Highways England says this will reduce congestion, improve safety and the reliability of people's journeys. The junction, used by thousands of people every day, is on the main route to and from the Tyne Tunnel and will mean that drivers travelling along the A19 will no longer have to queue at the roundabout to go straight on. Instead they will be able to use a new section of road which will run under the existing junction.

The job also involves building two bridges to carry the roundabout traffic across the lowered A19, a replacement bridge to support the A1058 Coast Road across the junction, new slip roads to provide access to the junction to and from the lowered A19, and two footbridges across the A1058 for pedestrians and cyclists.

Work is due to start in the 2016/17 summer and is scheduled to last for at least two years.

Seen a better one? Email [daniel.newcombe@at.govt.nz](mailto:daniel.newcombe@at.govt.nz)



*Must be a mathematician's car...*



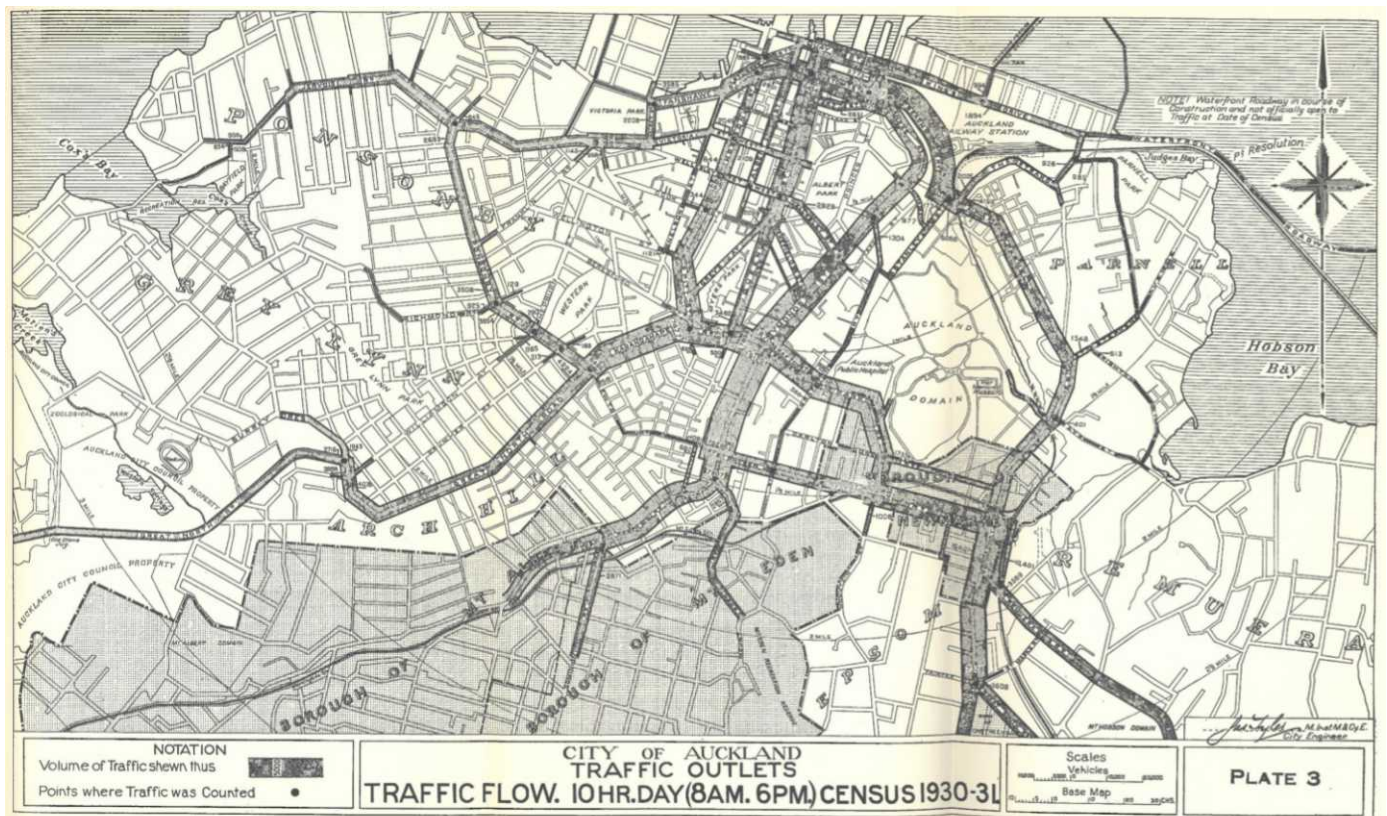
# Caption competition



How did Ron Weasley get invited and has Harry Potter also been employed by AT to deal with any unforeseen project issues?

This edition's caption comes from T2's David Mitchell, who was intrigued by the cover image on the previous Roundabout. If you have any other suggestions, send it to: [daniel.newcombe@at.govt.nz](mailto:daniel.newcombe@at.govt.nz)

Old school traffic plots (drawn by hand) from the 1930s. Before motorways and the Harbour Bridge.





# SH20 Waterview update



The project mechanical and electrical team have made a flying start to the jet fans installation inside the new Waterview tunnels (see photos this page). 62 jet fans are being fixed to the steel hangers which suspend from the tunnels' ceilings.

"We have a well organised and high performing team working together to fit the jet fans inside Auckland's world class tunnels, says Project Engineer Justin Johnson.

With each jet fan weighing 1.8 tonnes each, 1.2 metres in diameter and six metres long, a Merlo crane is used to lift it towards the ceiling with a specially designed steel cradle strapped on to it to firmly hold it in place. A person on each side of the jet fan on a boom lift bolts it onto a hanger.

"The jet fans are German-made equipped with state of the art technology which are an essential part of any

road tunnel for its ventilation and fire safety purposes," says Justin. "All 62 jet fans arrived in New Zealand in 27 shipments from Germany once they had been tested."

Kiwi ingenuity was also involved in this project, with the design team re-designing the steel cradle based on their knowledge of the conditions inside the tunnels. The tunnels' jet fans will be fully controlled by the control centre at Auckland Transport Operations Centre and in emergency situations operated out of the maintenance building on Great North Road.

The fans will reduce pollution and temperatures to acceptable limits for a comfortable tunnel environment and safety for drivers. They will also exhaust the air from vehicle emissions and then disperse it into the atmosphere via 15 metre high ventilation stacks. The reversible jet fans provide 100% thrust reversibility. At full thrust they can blow away fire/smoke from inside of the tunnels and from blowing a particular direction.



The southbound tunnel passed their first significant testing last month. Tested under the watchful eyes of a Commissioning Engineer from German manufacturer, Whitt & Sohn.

A five minute 'flow test' was utilised for the exercise which involved switching on each fan to run independently while assessing its operation and electrical usage for each flow direction.

Each jet fan was controlled from a switchboard in Cross Passage 16, and operated at speeds of over 140km/h. Its initial thrust is about the same pushing force as an All Black prop at 1.47 kilonewtons.



One of the most distinctive features of the Waterview Connection project is rapidly taking shape above ground at Great North Road in Waterview (see photos this and previous page).



The Northern Ventilation Stack, required to exhaust vehicle emissions into the air, is steadily towering to its peak height of 15m. Architects set the project's designers and engineer some tricky challenges. Instead of something conventional that's round or square, they planned a stack that's ellipse or egg shaped then cut out the middle section of the ellipse and joined the two remaining sections together.

"Currently the eastern and western joints in the stack give it the appearance of the bow of a ship. The complicated geometry is not easy to work with as no two panels are exactly the same," says Site Engineer Devon Bainbridge.

To make things a little more complicated it's on a 10

degree lean. "It's made up of five levels of rings. There are four concrete segments to each ring. We have two more to install to complete the structure by early-October," says Devon.

The bronze coloured steel fins will start to be installed upon completion of the main structure to provide an architectural finish. The fins wrap around the stack with an ever-changing kink fabricated into them giving the illusion of a spiral.

Air from inside the tunnels will be pushed by jet fans into the Northern Ventilation Building along a 90m long ventilation tunnel under Great North Road before being ejected into the atmosphere through the stack.

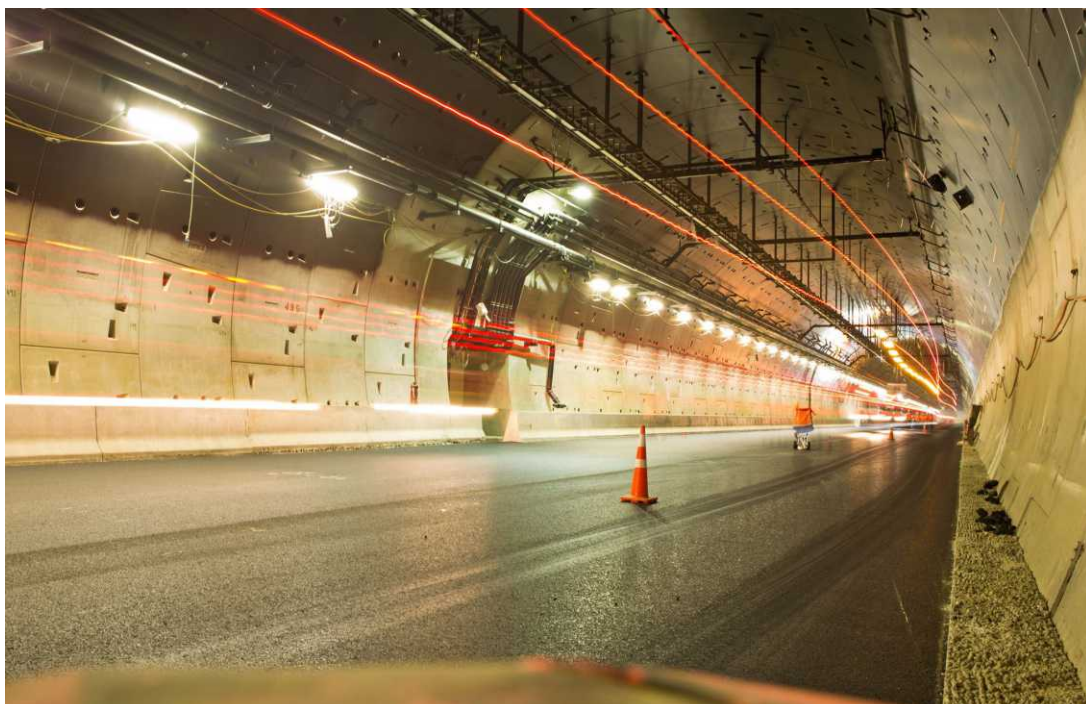
Tunnel vent stacks are considered the most efficient way of dispersing air from the tunnels. Air quality monitoring will take place prior to opening of the tunnels to demonstrate that the relevant National Environmental Standards for air quality standards are being met by the Well-Connected Alliance.

The pavement team working underground will achieve a massive milestone in early September. After completing the establishment of three layers of structural asphalt inside both tunnels, the commencement of the final phase of the pavement work marks a significant marker in the team's work programme (see photo below).

"Our team will lay a Stone Mastic Asphalt (SMA) on top of the structural asphalt to complete the tunnels' road surface," says Site Engineer Brady Church.

"We'll remove all other machines and plant to lay the SMA in the entire northbound tunnel. The application of SMA effectively makes it road ready."

The road surface of the northbound tunnel will have SMA applied to it first, before the southbound tunnel,



in total a paved area of 209,600 square metres. The SMA layer replaces the open graded porous asphalt (OGPA) layer that is found on the openair motorway, as the tunnel is watertight and won't be affect by weather.

Road markings and motorway signage will be installed prior to commissioning and opening of the Waterview Connection project in early 2017 – New Zealand's largest roading project ever.

If you want to find out a bit more information on the project, visit: [www.nzta.govt.nz/projects/waterviewconnection](http://www.nzta.govt.nz/projects/waterviewconnection) or for regular updates and some great vidoes [www.facebook.com/AliceTBM](http://www.facebook.com/AliceTBM)



# Transport Advice

## FOR DUMMIES



*A tongue-in-cheek column on transport matters by The Transport Guy. The contents do not represent the views of the IPENZ Transportation Group, or anyone else for that matter. Follow the advice at your own risk.*

### Dear Transport Guy

Sorry to bring politics into Roundabout, but do you know if the Brexit will have an effect on transport issues in Britain?

**Colin, Brighton**

### Dear Colon

You are quite right to be interested in the implications of Brexit. By disconnecting with Europe, Britain is entering a world of change.

Those parts of the UK that voted to remain in the EU (like Scotland and London) will be required to model the EU transport rules - driving on the right, using kilometres instead of miles for distance. The rest of the UK will stick to the existing rules.

This will create chaos at transition points, though to be fair the M25 has always been a mess so driving on different sides of the road may not make much difference.

~Transport Guy

### Dear Transport Guy

As we head into the local government elections, it seems we are re-litigating the same transport issues from years ago. Cycle lanes in Wellington. Rail across the harbour in Auckland. Managing our roads more efficiently everywhere else. Why do we never seem to make any progress?

**Sebastian, Howick**

### Dear Sabotage

You are quite right. It's as if the script from every previous election has just been rolled out again. But if you look closely you will see some differences.

In Auckland, previous elections were focused on the merits of the City Rail Link (often against it) but now the arguments are for more rail, not less. Now the North Shore folk want it too. In Wellington the cycle lane debate is about modifications to existing cycle facilities, rather than deciding to install them in the first place.

So the debate is the same but different. It has changed tense. Rather than being about what we should do, it's about what we have done. That at least is positive.

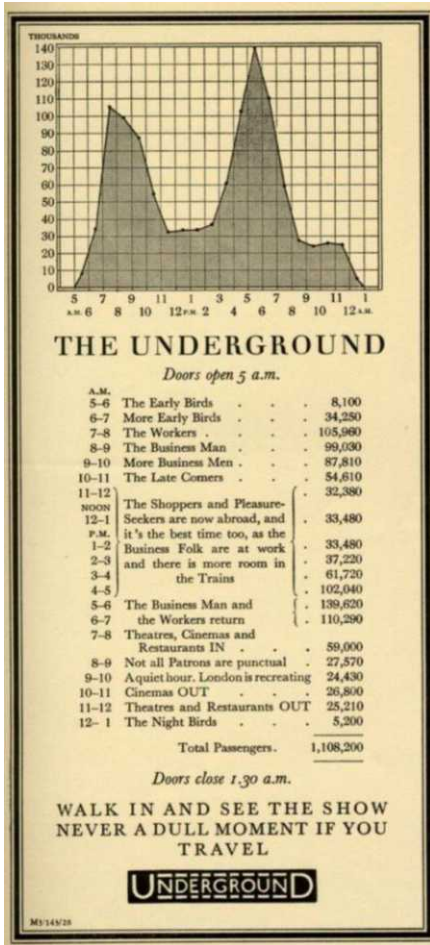
Unfortunately all the players involved in the discussion are politicians, who are - I think you will agree - the worst possible people to make reasoned transport decisions.

~Transport Guy



Do you have a dumb question for Transport Guy? Email it to: [transportfordummies@gmail.com](mailto:transportfordummies@gmail.com) and he'll do his best to answer...





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# Kids explain traffic engineering



**Before Walking School Buses were invented they used to just call it 'walking to school'**